JULY 1957

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SCIENCES

Contractors and Engineers

magazine of modern construction

Plant-site grading *Page 20*

South Dakota highway emphasizes Texaco Asphalt versatility

Four different Texaco Asphalt products were used in constructing the wearing surface, base and shoulders of this 15.7 mile South Dakota highway project.

Contractor
Northwestern Engineering Co.
Rapid City, S. D.

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Contractors and Engineers

magazine of modern construction

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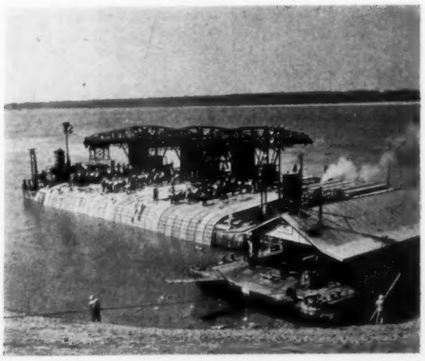

Concrete mattress to control erosion. Page 66

editorial

Industry lends a hand

Among the features in this issue are two articles on experimental road building in which steel companies are prime sponsors. Both jobs are located in Pennsylvania, the nation's great steel producing state.

One project (see pg. 54) consisting of a 2-mile stretch of continuously reinforced, jointless concrete pavement has the American Iron and Steel Institute—representing the steel industry—as a co-sponsor with the Pennsylvania Department of Highways, U. S. Bureau of Public Roads, and Lehigh University. The other project (see pg. 158) is a 600-foot stretch of prestressed concrete roadway that was built by Jones & Laughlin Steel Corp. in Pittsburgh.

Both jobs are noteworthy as definite contributions to practical research in the art of road construction. In the reinforced jointless pavement, slab depths are 7, 8, and 9 inches as compared with the customary 10-inch pavement in Pennsylvania. Subgrade depths were also varied to allow comparison of pavement performances at some later date. But the most important element in this test was the use of steel bar mat reinforcing, heavier than the mesh customarily employed in concrete paving. The use of this heavy interlacing of longitudinal and transverse rods is intended to prevent cracking, and to eliminate the need for joints and all the trouble that they often bring.

The J&L paving experiment is particularly interesting since it is the first major attempt in this country to prestress a concrete highway. Prestressing of bridges and other structures is spreading rapidly in the United States, but its use in road work has so far been limited to a few European countries. Here again we have a thin slab, only 5 inches thick, which is prestressed by post-tensioning with twenty-four wire strands. Six flexible conduits, each containing four strands, are anchored in the concrete as shown in the picture above.

Another industrial firm has also lent a hand with this experiment. B. F. Goodrich Industrial Products Co., in collaboration with J&L, designed and built a new transverse joint, 12 inches wide and extending the full depth of the slab. Two such joints separate the 400-foot prestressed section from 100-foot prestressed sections at each end to simulate large-scale paving.

Both of these recently built highways are to be carefully observed and tested during the coming months. Both projects have as their objective the use of a thinner concrete slab that will be free of cracks despite the pounding of heavy traffic. Naturally these pavements must also prove economical before they can be adopted. With thinner slabs the saving in cement is obvious, but whether this saving and expected lower maintenance cost can offset the greater expense of heavier reinforcing, or the installation of the prestressing materials, remains to be seen. Certainly faster and simpler methods of prestressing, on some kind of assembly-line pattern no doubt, are bound to develop from experiments like the one in Pittsburgh. Industry is to be commended for its part in these practical and useful experiments.

Dirt spills off a heaped International 2T75 scraper push-loaded by an Allis-Chalmers HD-19 tractor during the grading of a 200-acre site for a new paper mill near Catawba, S. C. The 3,000,000-yard earthmoving job is being handled by a fleet of 25 scrapers and 29 tractors, which moves an average of 30,000 yards per day.
Page 20

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A Bell Aircraft 47 H helicopter hovers over the steeple as it gets ready to position a steel section. A walkie-talkie was used on a platform of the steeple to direct the operations.

Whirley bird "flies in" steel for crews on church steeple

A new method of erecting structural steel—and one that may influence work at high elevations or areas not readily accessible—was used to erect a steeple on the $5 million Kirk-in-the-Hills Church in Bloomfield Township, Mich.

Located on West Long Lake Road, the church has a 2,000-pound, hollow, cast-iron steeple. The base of the spire is located 145 feet above grade, and its height of 40 feet makes the steeple rise to 185 feet.

Helicopters used

Ordinarily, steel erection would have been done by a crane with a 180-foot boom. But the structural steel contractor had two helicopters handle the job at a fraction of the cost of using a crane—and with a saving in time that helped keep costs to a minimum.

The 2,000-pound steeple was first cut into 400-pound pieces ranging from 6.6 feet to 12.3 feet in length. These were picked up and positioned by two Bell Aircraft 47 H helicopters so that the steel erection crew could complete the installation job.

Job takes three hours

Both the helicopters and the pilots, furnished by Whirl-Air, Inc., actually became an integral part of the erection crew and its equipment. A walkie-talkie radio, located on a platform 145 feet up, aided the 'copters in placing the steel.

The first try at erecting the steeple was called off because of technical difficulties and gusty winds, but about a week later, the 3-hour job went off without a hitch, despite a steady rain.

The job went so well that Nathaniel Saulter, vice president of Acorn Iron Works, plans to use the technique to erect another steeple in Ann Arbor and a flagpole in Denton, Mich.

Robert D. Sallen was the engineer in charge of the work, and Ray Schafer was erection crew foreman for Acron Iron Works. O. W. Burke Co., Detroit, Mich., was the general contractor for the church, which was designed by the architectural firm of George D. Mason Co., Detroit.

THE END

▲ One of "the earth-movin'est earth-movers around," Holloway Construction Co., Livonia, Mich., proved it again when grading for relocation of U. S. 16 at Brighton, Mich. Work started 12 days after job was let – and 6 miles of sand, clay and muck up to 40 feet deep were hustled as never before. Tires shown are Goodyear TUBELESS Sure-Grip Lug – built with triple-tempered TRIPLE-TOUGH 3-T NYLON Cord.

▲ GOODYEAR BIG TIRE SERVICE at Holloway's U. S. 23 relocation job at Fenton, Mich. Strategically located, well-equipped, well-manned service like this cuts down time to a minimum wherever Goodyear helps jobs roll. Tire shown is Goodyear TUBELESS again!

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Workmen prepare forms for the plant floor slab while a Lima 802, with 128-foot leads and a Vulcan No. 1 hammer, drives thin-shell Armco Hel-Cor piling for one of the three chimney foundations. Some 261 piles for the foundation are being driven in two sections to a depth of about 80 feet.

The 41-foot-high form sections, made for the job by Blaw-Knox, are stripped from the inside of the west wall by a Bucyrus-Erie 71-B crane with 100-foot boom. The three 12×41-foot sections made it possible to complete a 36-foot-wide and 41-foot-high pour in 4½ days.

Steel forms for generating station make 41-foot-high lifts economical

Only 4½ days needed to complete 36-foot-wide section of counterfort and tapering wall for plant foundation

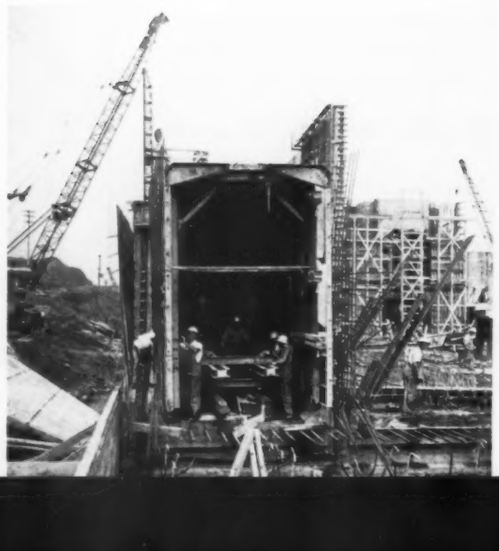
by BILL ALLEN, field editor

Some of the highest lifts ever made for foundation walls are those being poured in 41-foot-high sections of steel forms for the Thos. H. Allen Electric Generating Station going up in Memphis, Tenn. With these forms, the contractor is able to complete a 36-foot-wide section of the complicated counterfort-type wall in only 4½ days.

But work on the foundation walls is not the only thing making this job unusual. The $121 million plant, under construction for the Memphis Light, Gas & Water Division of the

While the Lima 802 drives the thin-shell piling for the chimney foundation, crew members complete the forming for the outside of the west wall. Each section of the outside wall form includes formwork for a counterfort which is poured monolithically with the walls.

Further advanced in construction is this chimney for unit No. 1. Here, reinforcing is being set for the 8-foot-thick slab, which will be poured in two sections. This will support one of the three 400-foot chimneys. The Cat D8 with LeTourneau-Westinghouse scraper is hauling sand backfill for a portion of the foundation walls.



Elsewhere on the site, the inside metal tunnel form for the 10-foot by 15-foot 10-inch discharge tunnel is being set. This traveling steel form, 36 feet long, may be adjusted for use in the 8×12-foot intake tunnel. The form is set at the proper elevation by jacks.

City of Memphis, is located on the south side of McKellar Lake, a former channel of the Mississippi, about five air miles southwest of downtown Memphis. Work on the plant is being supervised by Burns & Roe, Inc., New York City, which holds the engineering contract for the 3-unit generating station.

When completed in 1965, the steam plant will be the tenth largest in the United States, containing three Westinghouse turbo-generating units with a rating of 250,000 kw each. Manufactured by the Babcock & Wilcox Co., each has a capacity of 2,100,000 pounds per hour and is designed for firing by either coal or natural gas. Each unit, weighing approximately 4,000 tons, will be 12 stories high.

The foundation of the building, expected to be completed by early spring, consists of a 270×572-foot reinforced-concrete slab that has a minimum thickness of 4 feet 8 inches. The slab is supported by 6,301 cast-in-place piles. The foundation walls, which rest on the edge of the slab, are of counterfort and wall-type construction. The 41-foot-high walls rise to the operating floor, which is at an elevation 8.6 feet above the highest recorded flood stage of the Mississippi River and about five feet above the top of the levee system.

The construction of the foundation walls is one of the major items in the $5 million contract for the substructure, which is held by J. A. Jones Construction Co., Nashville, Tenn. To handle the complicated job of forming the counterforts and tapering wall, the contractor is using steel forms specially fabricated for the project by the Blaw-Knox Co.

These forms are built in 12×41-foot individual sections, which are assembled on the job to make either 24 or 36-foot-long sections for the total height of the wall. Each individual section of the outside wall form includes the formwork for the counterfort. The sections for the inside walls are less complicated; they are either flat with a 3-foot toe, or contain a pilaster for the height of the form. The inside forms also contain doors for the concrete, and these are staggered at 5-foot intervals for the height of the wall.

Forming walls

To start a 36-foot long section, the contractor first sets the three 12-foot sections of the counterfort forms in place and secures them. This takes about one day. In the next operation, which takes two days, the reinforcing steel for the wall and counterfort is set in place. The job of setting the forms for the inside wall takes only half a day. This operation goes fast because the back form is already positioned, and it only remains to tie the inside form to the back form with bolts and Superior coil struts. Placing the concrete in a 41-foot-high lift takes one day, making a total of 4½ days for the entire operation.

(Continued on next page)

Foundation columns are poured for the transformer pads on the south side of the building. Columns are above the discharge tunnel. The Gar-Bro 1-yard bucket being emptied into the tremie is filled with concrete from transit-mix trucks.

THE CASE OF
THE SLIPPING MAINTENANCE PROGRAM
BILL, THAT MOTOR GRADER CLUTCH SHOULD BE ADJUSTED—
I KNOW, BUT I'M MUCH TOO BUSY! OURS IS A BIG OPERATION, YOU KNOW.
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—AND WE HAVE SPECIALIZED REPAIR BAYS WHERE WE CAN REALLY DO A COMPLETE JOB! DO IT QUICK, TOO.
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SOME DAYS LATER
THERE! THIS ONE'S READY TO ROLL AGAIN. WE'RE CERTAINLY KEEPING AHEAD OF MAINTENANCE AROUND HERE THESE DAYS!
LET'S CHECK ON MACHINE NO. 17. THE OPERATOR REPORTED A LEAKY PUMP-
AND, MY MAINTENANCE PROGRAM IS DEFINITELY WORKING SINCE YOU TOOK OVER THE TIME-CONSUMING REPAIR WORK... WE ALSO HAVE FEWER MAJOR REPAIRS NOW.
GOOD! SAY, HOW ABOUT ATTENDING ONE OF OUR FUTURE CAT CARE SCHOOLS?
CATERPILLAR*
*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.
CAT CARE FOR LONGER WEAR
LET ME HELP KEEP YOUR CAT* EQUIPMENT ON THE JOB!
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.
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Reinforcing for one of the chimney slabs is swung to the forms by a Lorain 25-ton Moto-Crane with a 60-foot boom and 20-foot jib. Each of the three chimneys of the plant will have an outside diameter of 30 feet at the base.

(*Continued from preceding page*)

The contractor has two complete sets of forms—one 24-foot and one 36-foot section with an additional 24-foot counterfort section, to speed the forming. As specifications require a 7-day period before one wall section may be poured abutting another, the contractor follows a skip-and-fill pattern.

Placing the concrete

Concrete for the walls arrives in Jaeger 6-yard mixers mounted on Mack trucks that drive onto the foundation slab adjacent to the wall. The transit-mixers chute the concrete to a Gar-Bro 3-yard laydown bucket which a Bucyrus-Erie 71-B crane lifts to the doors of the inside wall forms. Electrical and gasoline-driven vibrators consolidate the mix as it is poured at a rate of about 30 cubic yards an hour. The concrete, which may be stripped of forms after 24 hours, is given a water cure for 14 days.

The 45,000 cubic yards of concrete for the building, being supplied by John A. Denie's Sons Co., Memphis, comes from a batch plant set up about 1.5 miles from the job. The 4,000-pound test concrete contains Pozzolith as an additive.

Tunnel forms

Blaw-Knox steel forms are also used in the construction of the tunnels in and adjoining the plant. Jones uses a 36-foot length of traveling steel form to build the 10-foot×15-foot 10-inch discharge tunnel. This form may also be adjusted to build the 8×12-foot intake tunnel. Traveling steel forms are also used for the 7×7-foot circulating tunnels that service the individual electric generating units.

Excavation

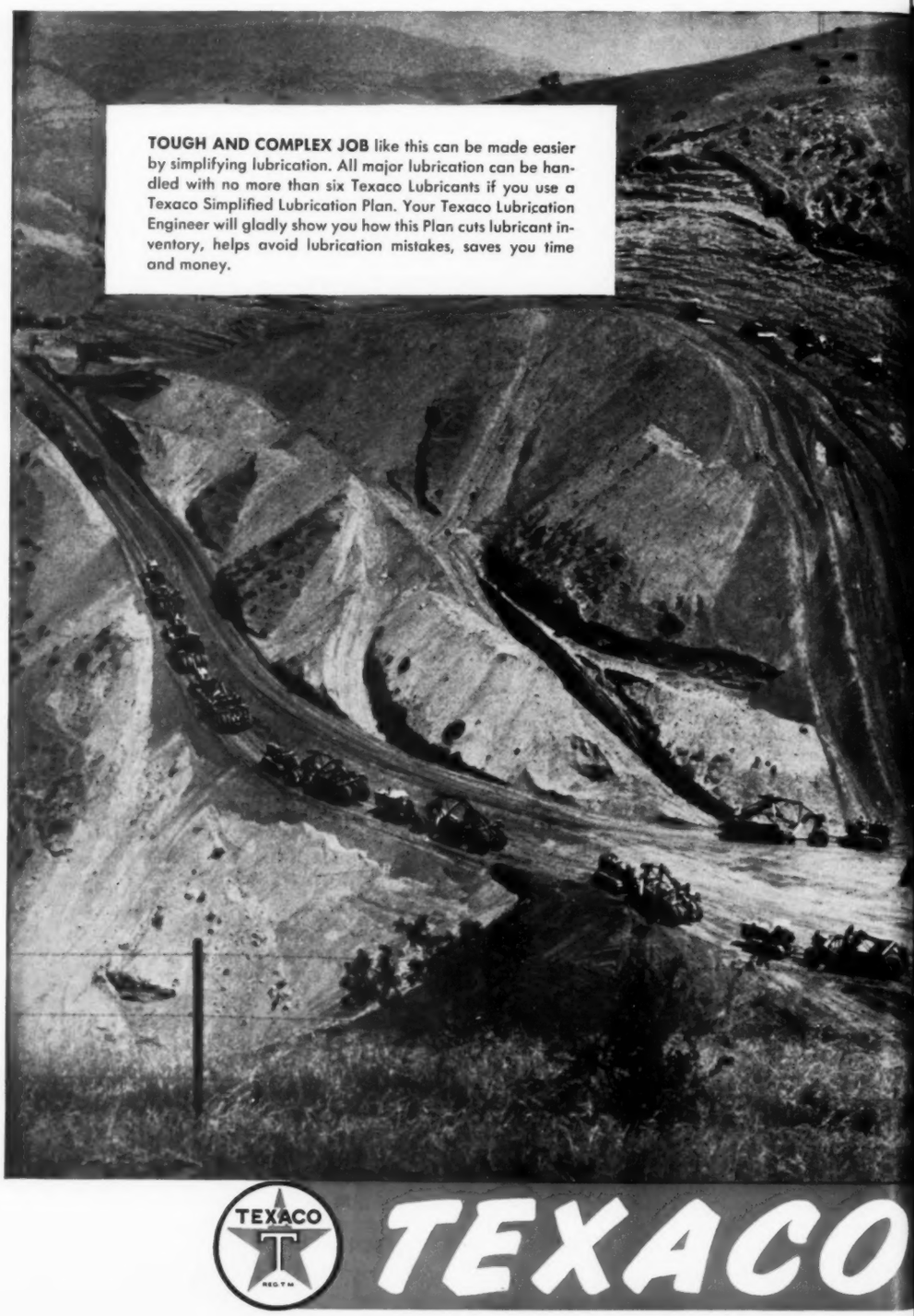
The 200,000 cubic yards of excavation for the building was started in September of 1956. A Page walking dragline dug out the 20-foot-deep hole and built a dike around the perimeter of the 330×632-foot excavation. The dike protected the excavation from possible flooding and later became a part of the site fill. This work was done by J. E. Jumonville and H. N. Rodgers & Sons Co., both of Memphis, under a subcontract from J. A. Jones.

Dewatering

Although the contractor was able to do little about heavy rains, he was able to keep ground water from entering the excavation. To keep the water table about two feet below the subgrade, Wellpoint Dewatering Corp., New York City, installed a Griffin wellpoint system around the bottom of the excavation. The 12 to 16-inch header line accommodates 28-foot-deep wellpoints on about four-foot centers. Two Griffin 12-inch pumps driven by GMC diesels discharge 7,000 gpm through a 20-inch line. The wellpoint system is used in conjunction with vertical sand drains that carry the ground water through layers of clay to be picked up by the well points.

Pile driving

With the cast-in-place piles that support the foundation slab already driven, work is well under way on the piling that will support the three chimneys. The 12¼-inch Hel-Cor thin-shell piling for the building was driven to an average depth of 60 feet to penetrate a layer of coarse sands for a minimum of 5 feet. Requirements for the piling are 50 tons for bearing and 25 tons for uplift. To provide a stronger tie of pile and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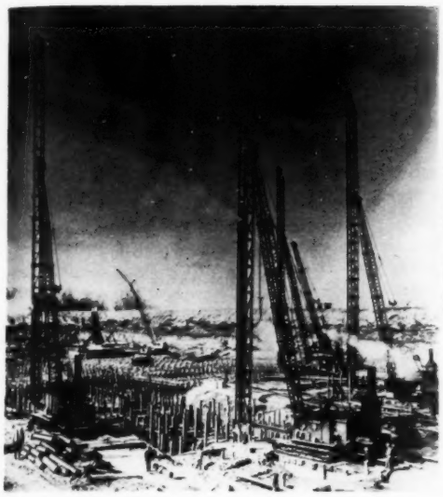
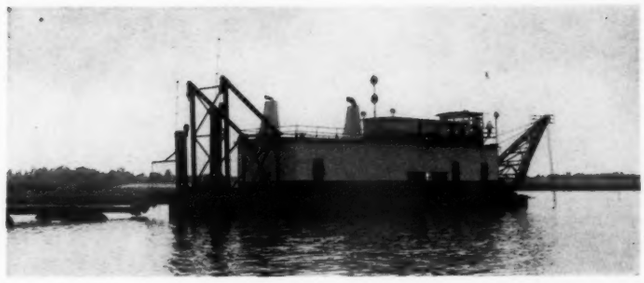


Four driving rigs of C. L. Guild Construction Co. use Cobi mandrels and Vulcan No. 1 hammers to drive 350,000 linear feet of 12½-inch, OD, 16-gage Armco Hel-Cor pile shells in 60-foot lengths for the generating station foundation.



A new hydraulic dredge with a cutter head on a 21-inch suction line is used by Missouri Dredging Co., St. Louis, Mo., to cut out the channel for harbor facilities and build up the site with fill. In good digging, it moves about 550 cubic yards per hour.

foundation slab, two No. 8 reinforcing bars extend from the top of the pile to a depth of about four feet in the concrete slab.

C. L. Guild Construction Co., East Providence, R. I., is using four rigs to drive the thin-shell piles. All four are Lima 802 cranes using 128-foot fixed leads and a No. 1 Vulcan hammer. The cranes mounted a vertical boiler at the rear of the cab. A Cobi mandrel used in driving is made of two half-ring sections of steel held together by heavy springs. Air pressure expanded a lining within the mandrel to force the two sections against the sides of the casing.

The piling for the three chimneys on the north side of the building is being driven to an average depth of 80 feet by the same rigs. Since the mandrel can handle only 60 feet of pipe, it is necessary to use about a 30-foot extension of thick-shelled Armco spiral welded pipe. The pipe is driven first without a mandrel. Then about 50 feet of Hel-Cor casing is attached by means of a collar to the top of the spiral welded pipe. Both sections are then driven as a unit.

Each of the three chimneys contains 261 piles to support the 8-foot-thick pad. The pad will support a chimney that is 400 feet high and 30 feet in diameter at its base. The reinforced-concrete stack will be lined with fire brick.

Site fill

The greater part of the 4.1 million cubic yards of site fill is being placed hydraulically by dredging the harbor in McKellar Lake. Missouri Dredging Co. of St. Louis, after let-

(*Continued on next page*)

First aid with a smile—this is supplied by Mrs. Sterling Kelly, RN, at the trailer first aid station. A registered nurse is on duty during all working shifts of the job.

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if you
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WITH
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There's no time for repairs on a job like this. Every piece of equipment must keep on the go . . . and give all the power it's got. That means engines must stay clean. And they do—with *Texaco Ursa Oil Heavy Duty*. Rings stay free and valves seat properly because *Texaco Ursa Oil Heavy Duty* is fully detergent and dispersive. It gives you full compression with complete combustion—it gives you what you need: dependable performance at full rated power. And both operating and maintenance costs come down because wear is reduced to a minimum.

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Hydraulic fill from the discharge line of the dredge is spread by a Cat D7 tractor-dozer. The 2.7 million cubic yards of harbor dredging is raising the ground elevation about 22 feet to provide storage space for 450,000 tons of coal.

(Continued from preceding page)

ting two subcontracts, is at present operating one dredge on the east end of the channel. This hydraulic dredge, which was only recently built by the contractor, uses a cutter head on the 21-inch suction line. A diesel-electric unit drives the Morris 18-inch pump at a speed of 680 rpm. In good digging, the pump can move 550 cubic yards of sand per hour.

At the discharge end of the 18-inch line a Caterpillar D7 tractor-dozer spreads the wet sand. The fill is raising the existing ground about 22 feet and will provide a storage space for 450,000 tons of coal. The coal will arrive by barge and be handled by conveyors.

Personnel

The project, which has been without a fatal accident, has a well-planned and equipped safety program. Part of the credit for this record goes to the two registered nurses who remain on duty at the site during the two working shifts. Their headquarters is a modern trailer equipped to meet any emergency. If the accident case is serious, the nurse administers first aid during the wait for the ambulance.

The project is under the general supervision of Burns & Roe Inc., which has David H. Kregg as project engineer. W. A. Weston is resident manager and J. R. Patterson is superintendent. For the J. A. Jones Construction Co., Sam Aaron is project manager, and George Marett, project engineer. Walter Calner is superintendent for C. L. Guild Construction Co., and George James is superintendent for the Missouri Dredging Co. The president of the Memphis, Light, Gas and Water Division is Thos. H. Allen; James Ray Morton is Vice President. THE END

Rubber road booklet

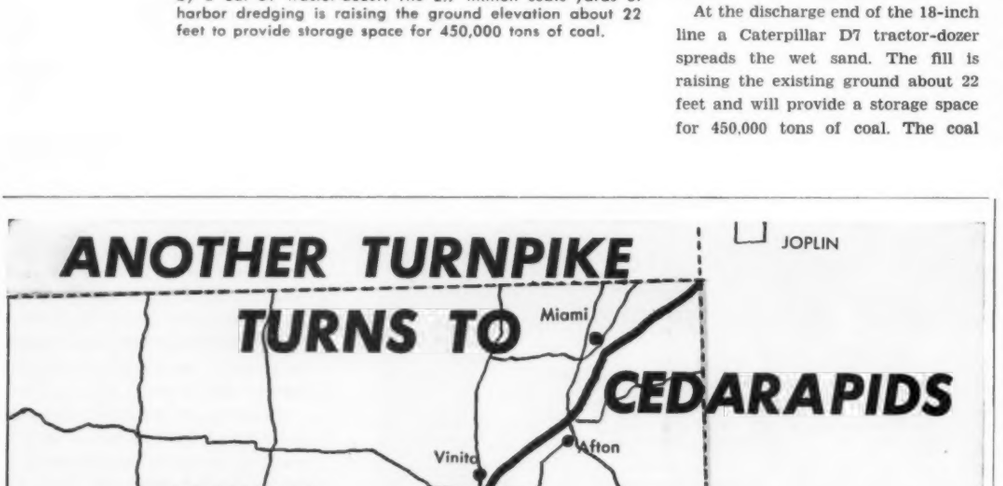
A 28-page, 4-color booklet on rubber roads in England has been reprinted by the Natural Rubber Bureau research laboratory.

Tests and statistical evidence are illustrated, and technical information sheets are included. The free booklet may be obtained from the bureau's research laboratory, 1101 Lee Highway, Arlington 9, Va.

Insley appoints Woodall

T. S. Woodall has been named a district sales representative for the Insley Mfg. Corp., Indianapolis, Ind. From headquarters at Atlanta, Ga., Woodall will cover North and South Carolina, Georgia, Florida, Alabama, and eastern Tennessee.

"I carry messages from the boss to the shovel operators."



for greater tonnages of low-cost aggregate with the

CEDARAPIDS COMMANDER

As competition gets rougher for the profitable Turnpike contracts, you need a plant that can supply specification aggregate in the schedule-beating quantities demanded . . .

That's the Cedarapids Commander!

You need a quality-built plant which gives you the steady, trouble-free production that increases your take-home pay on each job . . .

That's the Commander!

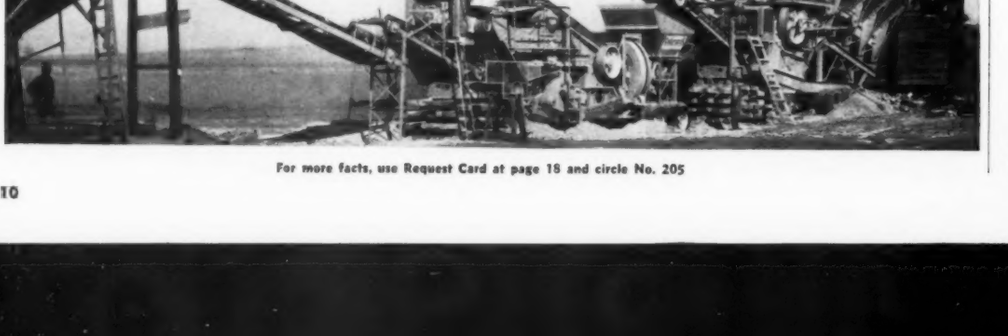
Commander capacity, versatility and low-cost performance are the reasons why contractors bidding and working the big Turnpike jobs turn to Cedarapids.

And if you have special problems to meet, or unusual conditions to lick . . . remember, there's a complete line of Cedarapids Portable and Stationary Plants, both aggregate producing and bituminous mixing, to help you make good money on every job.

Your construction-experienced Cedarapids distributor will gladly explain Commander benefits, or help you select the Cedarapids equipment you need. Call on him today!

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

Producing aggregate for two contracts totaling almost 1½ million dollars, the Cedarapids Commander teams up with a Cedarapids Portable Primary Plant to make money for Broce Construction Co. of Oklahoma, Inc., of Woodward, Oklahoma.



For more facts, use Request Card at page 15 and circle No. 205

N. C. starts training program for engineers

Nine civil engineering graduates of North Carolina State College have started a two-year training program with the North Carolina State Highway and Public Works Commission. During the training, the men will work in nine departments of the commission—statistics and planning, roadway location, bridge location, roadway design, materials and tests, bridge design, right-of-way, and construction and maintenance.

The two-year program will give the men practical on-the-job work experience and a fundamental knowledge of highway operations. At the completion of the training, the men should qualify as capable highway engineers, and will be placed in positions in the highway organization.

Chief highway engineer W. H. Rogers, Jr., center, welcomes four of the nine trainees for the training program of the North Carolina State Highway Commission. From left to right are Cohen O. White, William Dudley, Rogers, James Davis, and William Caddell, Jr.

Illinois rejects paving bid for AASHO road test

A single bid of $6,622,514 for paving the six test loops for the American Association of State Highway Officials' road tests at Ottawa, Ill., has been rejected by the Illinois Division of Highways, with the concurrence of the Bureau of Public Roads. The bid was rejected because it exceeded the funds that were available for this phase of the construction work.

The rejected bid has made it impossible to complete construction of the project to allow adequate time for curing of pavements, and to install the necessary recording instruments before adverse weather would stop operation. The AASHO will chart a new course and set new target dates for the completion of construction and the start of test traffic.

The Highway Research Board is administrating and supervising the $20 million test, which is the largest highway research job ever undertaken.

Fleco has anniversary

This year, the Fleco Corp., Jacksonville, Fla., is celebrating its 10th anniversary in the manufacture of land clearing equipment as an allied manufacturer of the Caterpillar Tractor Co., Peoria, Ill. The equipment offered by Fleco in 1947 included the detachable stumper and root rake. Since that date, the firm has expanded its land clearing products to include 20 major pieces of equipment such as the D9 M-A rake and Traxcavator rakes.

L. B. Foster names salesmen

Russell W. Yanicki has been named to the home office sales staff of the L. B. Foster Co., Pittsburgh, Pa. Yanicki will specialize in the development and sale of aluminum railing which Foster markets for bridge rail and highway guards.

Raymond J. Warren has joined the Chicago office of the firm. His territory includes Indiana, Michigan, and Missouri.

AT THIS YEAR'S ROAD SHOW CONTRACTORS WHO USE THE STANDARD – LEWIS SUBGRADER KEPT TELLING US...

"STANDARD STEEL has the best subgrader in the world! Why don't you tell other road men about our experience?"

"we finished 12,000 lineal feet of 25 foot subgrade in 8 hours—with our STANDARD-LEWIS"

"—my STANDARD-LEWIS subgrader averaged 8 yards over the side forms a minute on an airport job."

"we found maintenance costs unbelievably low."

Yes, road men say this about their STANDARD-LEWIS Subgrader, designed and built for rugged, tough-service! In fact, contractors say that every STANDARD-LEWIS Subgrader, some in use for ten years or more, has operated continuously at low cost... *not a single day lost due to breakdowns.* Fine grading and spoiling of excess materials over either side form at depths up to 25 inches—it can't be stalled by the toughest subgrade. Clears manholes and culverts, and the end can be quickly removed to avoid roadside obstacles. Write today for the complete story.

OPERATING MECHANISM. The simple cable hoist raises and lowers subgrader for varying depths of cut or for passing over obstructions in the subgrade. The belt conveyor is mounted on rollers which travel in tracks and is designed so that sections may be quickly added or removed.

SPECIFICATIONS

POWER—4 Cylinder gasoline or diesel engine; 30 H. P. at 1800 R.P.M.

TRANSMISSION—Standard Industrial Automotive 4-speed type. Fully reversible at all speeds.

HOIST—Lever controlled, cable operated.

CONVEYOR SYSTEM—Endless belt, steel reinforced and mounted on roller equipped chain running in tracks.

TRACTION WHEELS—steel or solid rubber tired. For side form travel or towing.

CUTTING DEPTH—up to 25 inches.

MAXIMUM BLADE ELEVATION—5 inches above top of header.

CUTTING WIDTH—Variable from 10 feet to 25 feet.

DEALERSHIPS IN SOME AREAS STILL AVAILABLE

STANDARD STEEL CORPORATION

General Offices and Factory, 5007 Boyle Avenue, Los Angeles 58, Calif.

and LEADER IRON WORKS

Midwest Offices and Factory
Decatur 7, Illinois

ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS

For more facts, use Request Card at page 18 and circle No. 206

Excavation of wet peat on the highway alignment is done by a Lime Paymaster with a Hendrix 1-yard bucket. After the area is excavated, it will be backfilled with sand for the roadbed.

Leapfrog operations on highway grading keep job cost down

Instead of grading 1.6 miles of highway relocation and bridge approaches near St. Cloud, Minn. in a start-to-finish sequence, a subcontractor leapfrogged his operations to do the job most economically.

Excavation of tough hardpan, loose sand and underwater peat provided additional complications for crews that had to complete some grading before bridges could be built, and complete other portions after the bridges had been completed.

D. H. Blattner & Sons, Albany, Minn., did this job as a subcontract under the $900,000 general contract for the construction of bridges and related grading. The general contractor was the Walter D. Giertsen Co., Minneapolis, Minn.

The entire project involves the relocation of State Route 23 to meet the approaches of a new bridge being constructed over the Mississippi River. There are twin overpass structures where the new relocation crosses U. S. 10, an underpass carrying the highways under a railroad, and a pedestrian overpass over the highways on Wilson Avenue in St. Cloud. Giertsen's contract includes the grading. A separate paving contract will be awarded later.

Planned by the Minnesota Department of Highways, this job is one of the last in a series of projects that will provide a divided highway between Sauk Centre and Minneapolis. This is one of Minnesota's busiest stretches of rural highway.

Starting on a sand hill, the project jumps directly into a wet swamp underlaid with peat. Across the swamp, the alignment climbs another sandy hill and then overpasses U. S. 10 before descending on a 3.1 per cent grade into a 22-foot-deep cut through 18 feet of hardpan to get under the tracks of the Northern Pacific Railroad. A complete interchange at the highway junction is part of the project.

Excavate underwater peat

To start the job, Blattner moved in two Lima Paymaster draglines with Hendrix 1-yard buckets and started digging peat from the swamp. The water level in the swamp was just about at ground surface, making all peat excavation below water. The draglines operated from timber mats, starting from solid ground. They worked their way across the swamp,

"JOHN A. WOODWARD"
All welded steel construction tugboat. Powered by 300 hp. Caterpillar Diesel engine.

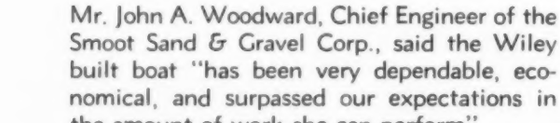
WILEY... for dependable ENGINEERING & WORKMANSHIP...

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

This tug has been in continuous service since 1950 towing 26' x 100' x 6'6" steel barges of sand and gravel from deposits along the Potomac River to Plants in Washington, D. C., for the Smoot Sand & Gravel Corp.

Mr. John A. Woodward, Chief Engineer of the Smoot Sand & Gravel Corp., said the Wiley built boat "has been very dependable, economical, and surpassed our expectations in the amount of work she can perform".

• COAL BARGES • FLOATING CRANES • PILE DRIVERS • TUG BOATS



WILEY MANUFACTURING COMPANY
Port Deposit, Md.

Write for free 38-page illustrated brochure, showing Wiley cranes, barges, tugs, etc., on the job.

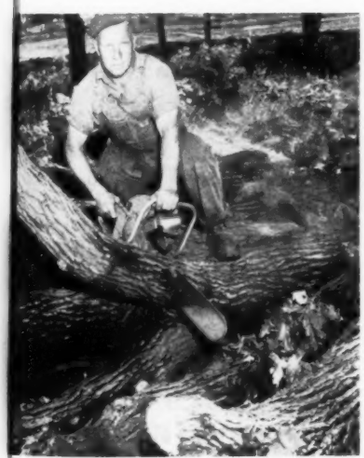
For more facts, use Request Card at page 18 and circle No. 207

Earthwork has to be done both before and after bridges are built; push-tractors drag broken pavement to fill when scrapers cannot work

When earthmoving spreads were stopped because of bad weather or for other reasons, the push tractors helped remove large chunks of broken pavement that were to be buried in the fill. The International TD-24 starts away with one of the slabs.

excavating and casting the waste material as far as possible to both sides of the right-of-way. Since all the material could not be moved far enough in one handling, the draglines had to move over and recast the peat. This excavation item, instead of being listed in the job quantities in cubical measurement, was paid for on an equipment-rental basis at the bid unit price per dragline hour. The planned quantity was 1,432 dragline hours.

While the draglines were digging peat, and other excavating equipment was being assembled for the job, the clearing and grubbing crews began removing trees, brush, and stumps from eight acres of the right-of-way. An Allis-Chalmers HD-19 tractor and an International TD-24 tractor equipped with dozers and a Le-



A workman uses a Homelite chain saw to cut one of the large trees felled along the right-of-way.

Tourneau-Westinghouse Tournadozer pushed over most of the trees and grubbed the stumps in the same operation.

Where the right-of-way passed through a part of the city, some of the large trees had to be removed in pieces and the stumps grubbed later. Workmen using Homelite chain saws cut down the large trees and sawed them up into pieces convenient for handling. The trees and brush were gathered into piles on the right-of-way and burned.

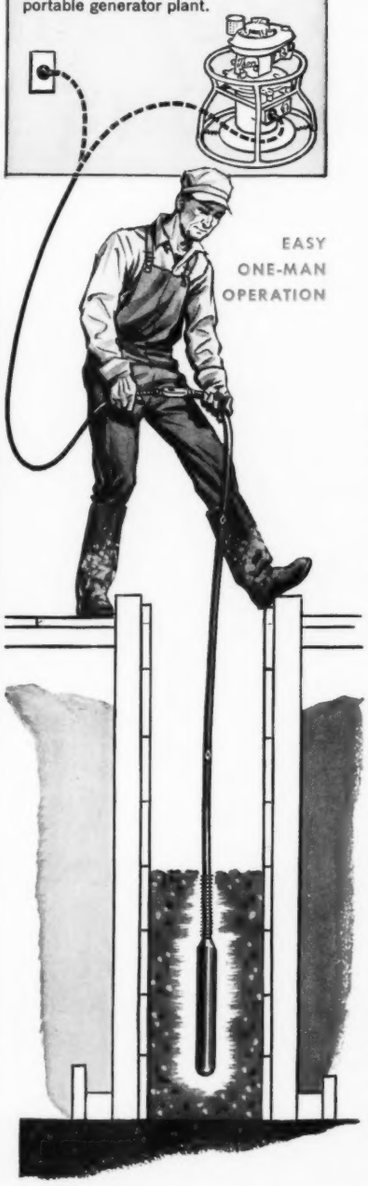
Scrapers move dirt

Practically all of the 444,000 cubic yards of excavation was handled by a

(*Continued on next page*)

25% more power! Lower vibrating cost!

Can be plugged into any standard 115-volt DC or 60-cycle AC outlet or portable generator plant.



New Thor
Motor-in-head
UNIVERSAL ELECTRIC
Concrete Vibrator

Better Vibration — Greater power and higher speed permit better penetration and compaction in stiffer mixes.

A Thor First — Exclusive new vibrating mechanism is housed in a special abrasion-resisting one-piece, heavy-wall housing. Bearing loads practically eliminated. Longer bearing life and increased operating efficiency are assured. No welded construction.

15,000 R.P.M. Thor Motor —Specially designed for concrete vibrating, triple-insulated against heat and heavy loads. Thermal controls automatically shut off current in case of excess heat or overload.

Reduce Costly Down Time! —Thor's motor-in-head construction does away with heavy, cumbersome, high-maintenance flexible shafts—permits easy one-man operation.

Streamlined Submersible Switch—Can't catch on reinforcing metal because it's round, smooth, and tapered to hose diameter, concrete-proof and moisture-proof. Special operating hose is neoprene-covered and neoprene-lined to resist oil, grease, and gasoline. Flexible, easy to maneuver on forms.

Model CV2-10 has 10-ft. hose and switch.

Model CV2-20 has 20-ft. hose and switch.

Model CV2-210 has 10-ft. hose on each end of switch.

All models include 25-ft. 3-conductor electric cable. Ask your Thor distributor for a free demonstration. Thor Power Tool Co., Prudential Plaza, Chicago 1, Ill.

Thor
PORTABLE POWER
TOOLS

THOR POWER TOOL COMPANY, Chicago
Branches in all principal cities
For more facts, use Request Card at page 18 and circle No. 208

After breaking off a big chunk of the old concrete pavement, this International TD-24 stands the block on end so that workmen can attach cables to it. The Cat D8 will then skid the chunk to a fill area for burial.

(*Continued from preceding page*)

spread of eight LeTourneau-Westinghouse C-Tournapulls. The scrapers were pushed on the loading cycle by three tractors, an International TD-24, a Caterpillar D8, and an Allis-Chalmers HD-19. All were equipped with torque converters.

A large proportion of the dirt had to be hauled long distances because of the big fill across the swamp and the high fills of the bridge approaches. Much of the haul was over sand road where the good floatation of the big rubber-tire scrapers enabled them to carry heaped loads at high travel speeds.

The big fill across the swamp was made with sand obtained from adjacent cuts and borrow pits. The scrapers hauled in from both sides, and the fills were pushed ahead by International TD-24 and TD-14 tractor-dozers and the Tournadozer. Once the fills had been brought up above water all the way across, the scrapers delivered the material to its final place in the fill.

Compaction of the fills was accomplished by operating the heavy equipment over them and by rolling with a small Bros sheepsfoot pulled by an International ID-9 tractor. The fills were required to be compacted to a density of 95 per cent (AASHO T99) up to the top three feet, and the top three feet were required to have a density of 98 per cent.

The shaping of the fills and maintenance of the haul roads was done by two motor graders, a Caterpillar No. 12 and an Austin-Western 99.

Rip hardpan

Where the highway underpassed the railroad, a 22-foot-deep cut was made. Some 18 feet of this maximum depth was in tough hardpan that had to be thoroughly ripped before the scrapers could load it. Blattner used a LeTourneau K-30 ripper pushed and pulled by one or more of the big tractors to scarify the hardpan in lifts.

The ripper was also called into use to assist in breaking up several sections of old pavement that had to be removed. After making one pass with the ripper, the International TD-24 tractor dozer was able to break off large sections of the old concrete slab. During periods when the scrapers were held up because of weather or other reasons, the push-tractors dragged these large pieces of concrete to the fill where they could be buried.

Grading done in phases

Heavy highway traffic, and complications with the bridge contractor and the railroad, made it necessary for the grading operations to be done in a series of carefully planned and timed phases.

Bridge approach earthwork had to be done first. The approach fills for the highway overpass bridges had to be in place before the bridge contractor could proceed with the bridges, since the abutments are located on the approach fills.

About 80,000 cubic yards of dirt from the west side of U. S. 10 had to be moved to the east side of that busy highway. Rather than fight the highway traffic and risk an accident, the contractor waited until the bridges were completed, and then hauled this material over the bridges.

Another complication occurred at the railroad crossing. Here, a plug has to be left in place to carry the temporary railroad track while the new bridge is being built on the railroad's regular alignment. Then, after

BIG YELLOW TEAM KEEPS HOT MIX MOVING AT 150 TONS PER HOUR

Commonwealth Construction Co., Ltd., of Vancouver, B. C., Canada, depends on Caterpillar equipment for its road building jobs. The pictures shown here were taken near Clearwater, B. C., where 11.3 miles of highway were being surfaced with hot mix.

Included in Commonwealth's big yellow team at the mixing plant are a CAT* D318 Engine that drives the blower, a D342 that drives the mixer and a D364 Electric Set that runs the dryer, bucket line, pumps, burners, lights and conveyors. Hourly production is approximately 150 tons of material.

Power for the portable crusher is supplied by another Caterpillar D342 Engine. A D318 powers the 1-yard dragline that loads the hopper, and a Cat D6 Tractor stockpiles the gravel as it comes from the crushing plant, handling about 1,800 tons a day. The seventh Caterpillar machine in the line-up is a No. 112 Motor Grader, used for scarifying and leveling the road.

Many contractors have found it pays to keep Cat equipment predominant in their spreads. Operators are familiar with Cat-built machines and feel at home with them. Rugged design, good control and ease of maintenance are other qualities which operators like about Cat equipment.

A quarter century of diesel leadership has produced a line of engines that are unbeatable for heavy-duty work. They're built to operate steadily without fouling, on a wide variety of low-cost fuels including ordinary No. 2 furnace oil. There are no cylinder ports to clean, and simple, single-orifice fuel injection valves need no cleaning or adjustment. Lubrication schedules are also simplified when all equipment is Caterpillar-built.

Three Cat Diesels power the Standard Steel hot mix plant: A D318, left; D342, center; and a D364 Electric Set, right.

the bridge is completed and the tracks removed, some time in October, the grading contractor will come back and take out the plug. Some dirt also has to be moved across the railroad right-of-way, and the contractor will do this job after the bridge is built.

With these many complications, it was not economical to plan on completing the work in one sequence. Starting in June, 1956, Blattner moved as much of the dirt as possible. Then he moved out and did some other jobs while the bridge contractor was completing his part of the work. This spring, some of the earth-moving equipment was brought back to the site to complete the job early this summer.

Personnel

The contracting firm of D. H. Blattner & Sons is owned and operated by three Blattner brothers, William H., Ervin A., and Kenneth. The brothers supervise their own work, spending most of their time on the job. William and Ervin were the supervisors of this work. The project manager for the general contractor, Walter D. Giertsen Co., was Oscar J. Hanson.

The project engineer on the work for the Minnesota Department of Highways was Charles Burrill. The work was done under the general supervision of the Brainerd District, of which A. W. Moulster is district engineer. The construction engineer of the department is J. H. Swanberg, and the commissioner of highways is M. J. Hoffman. THE END

With the 1957 tourist season moving into high gear, the Pennsylvania Department of Highways has 32 roadside rests in use. More than 350 picnic tables have been placed beside the more important highways.

HRB book covers de-icing effects on cars, pavement

"Effect of De-icing Chlorides on Vehicles and Pavements", Bulletin 150, may be purchased for 75 cents from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The book contains three papers, the first of which reports that greater amounts of surface scaling occur with intermediate and relatively low concentration of de-icers. New information is also presented on the effect of de-icers.

The second paper discusses the effect of de-icing salts on automobile corrosion. The last paper reports that non-air-entrained concrete is not resistant to scaling, and that a minimum curing period is necessary before air-entrained concrete is resistant to scaling.

Charts, tables, and graphs supplement all written material.

Precision Controls sets up new sales program

Precision Controls Co., Minneapolis, Minn., manufacturer of accessory power steering equipment for motor graders and tractors, is now setting up a new sales program for dealers, manufacturers, and contractors.

Sales representatives will call on dealers to stimulate sales; see contractors to promote the products in behalf of dealers or to make sales; and visit manufacturers to establish Precision Controls' products as original equipment.

Sherman Products appoints

Eight men have been appointed field sales and service representatives for Sherman Division, Sherman Products, Inc., Royal Oak, Mich. Those who have completed the three-week training course are Ralph L. Tennant, Lauren F. Moore, Warren C. Simon, Joe C. Cox, Wayland G. Martin, W. E. Blackburn, Jr., James P. Haar, and Roy C. Nicholson.

The division has also appointed William W. Wigle assistant sales manager. Wigle has served the firm as the Kansas City zone manager, Canadian zone manager, and product specialist on the Sherman front-end loader.

Cat engines to have certification of power

A program of certification that gives Caterpillar engine owners proof of their engine's horsepower capabilities has been introduced by Caterpillar Tractor Co.

Notarized power certificates will be given to all purchasers of Caterpillar industrial or marine engine arrangements, attesting that the engine is capable of the full capacity of its horsepower rating. The certification, issued at the time of delivery, will also record the engine model, and arrangement, serial number, and shipping date. The engine's power and speed seating will also be listed, along with its power rating.

←For more facts, circle No. 209

This D342 Engine drives the Pioneer portable crusher. In background, working on the gravel stockpile, is a Caterpillar D6 Tractor.

e of the most important factors in standard- is the availability of prompt, efficient serv- all machines from a single, responsible —your Caterpillar Dealer.

has facts and figures to prove the dollars- nts advantages of making Cat equipment the ne of your spread. And he backs the long life of that equipment with reliable service terpillar parts you can trust.

terpillar Tractor Co., Peoria, Illinois, U. S. A.

ATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

The Koehring dragline, with 1-yard bucket, is powered by a Cat D318 Engine.

A Caterpillar No. 112 Motor Grader scarifies and grades road surface before asphalt mix is laid.

manufacturer memos

B-E elects Litle chairman of board and president

William L. Litle has been elected chairman of the board, and re-elected president of the Bucyrus-Erie Co., South Milwaukee, Wis. Litle, a 31-year veteran of the firm, has been

William L. Litle, elected president and chairman of the board for the Bucyrus-Erie Co.

president of B-E since 1952. He has served on the board of directors since 1947.

Honorary chairman of the board is William W. Colman, who retired as chairman of the board and of the executive committee after 52 years with the firm. Albert S. Puelicher has been elected chairman of the executive committee, replacing Coleman. Other officers are Lyle S. Cline, vice president and secretary; and David W. Harris, vice president. Re-elected officers are Peter H. Birckhead, Frederick C. Weiblen, George Y. Anderson, and John A. Wettergreen, vice presidents; and Victor C. Studley, treasurer.

At the same time, the firm appointed J. V. S. Norton assistant export sales manager. He has worked in the firm's New York export sales department office since joining the company in 1945.

Flood elected to Frank G. Hough Co. board

T. F. Flood has been elected to the board of directors of the Frank G. Hough Co., Libertyville, Ill. Flood, formerly vice president of production,

T. F. Flood, newly elected member of the board of directors of the Frank G. Hough Co.

has been given the additional responsibilities of vice president of sales and manufacturing.

A member of the firm for the past 12 years, Flood has served as yard stores supervisor, production control manager, production manager, and vice president of production.

GMC division names Jolly

E. W. Jolly has been appointed truck fleet sales manager for the Truck & Coach Division, General Motors Corp., Pontiac, Mich. Jolly is succeeded in his former post of Detroit zone manager by V. W. Jones.

Hyster appoints P. Hill executive vice president

Philip S. Hill has been appointed executive vice president of the Hyster Co., Portland, Oreg. Hill, a member of the firm for 20 years, has been vice president in charge of sales, and has also been in many phases of management—service, sales, engineering, purchasing, production.

Virgil L. Levering has been district representative for the northeast territory of the Hyster Co., Portland, Oreg. Levering, formerly in the firm's Western Division, will work with the company's dealers in the Northeastern and Middle-Atlantic states, and eastern Canada.

Philip S. Hill, executive vice president of Hyster Co.

W. R. Washburn, until recently a Caterpillar Tractor Co. distributor in Quincy and Peoria, Ill., has been elected to the firm's board of directors. He will be active in developing new products for Hyster.

Canadian manufacturer for Buck Equipment Corp.

The London Concrete Machinery Co., Ltd., London, Ontario, Canada, has been licensed to manufacture portable hoisting machines for the Buck Equipment Corp., Cincinnati, Ohio. London Concrete will have exclusive manufacturing and distributing rights in Canada.

The hoists are used as elevators for raising building and maintenance materials to heights of 45 feet. London Concrete has appointed 14 dealers to handle sales of the hoists in various territories.

Euclid...the most complete

Euclid's expanded line of earthmoving equipment gives you the biggest range of types and capacities in the industry. Whatever your requirements may be—for a small grading job or a multi-million yard project—there are "Eucs" that will move more dirt at lower cost than other equipment.

7 WHEEL SCRAPERS

Payload capacities of 10, 12, 18, 22, 35, 4[5] and 50 tons...128 to 600 total h.p....5 an[d] Twin-Pow[er] 10-speed transmissions and Torqmatic Drives...[8] and 24 [mph] top speeds with full payload up to 36 mph...[Hy]-25 and overhung engine tractor models have 12 an[d]...two eng[ine] 35-ton capacity semi-trailer bodies that a[re] separate To[rque] interchangeable with 7 and 18-yd. scraper[s] tractor and [4]36 and 51

CRAWLER TRACTORS

A new concept in tractor design, Model TC-12 h[as] exceptional maneuverability and ease of handling. Each track has a separate power train with 218 h[p] engine and Torqmatic Drive for a total of 436 h.p.. speeds up to 8 mph. forward or reverse..."on-the-go" shifting...8 track rollers and 27" track shoes f[or] balance and stability.

The TC-12 is the first production model of a complete line of crawler tractors now being developed and field tested by Euclid. It can be equipped with hydraulic or cable controlled blades and other heavy duty attachments.

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Jacque Jones, newly elected president of Huber-Warco Co.

Huber-Warco elects Jones president

Jacque Jones has been elected president of the Huber-Warco Co., Marion, Ohio, succeeding Don A. Howard, who retired. Jones has served as executive vice president of the firm for more than two years. Prior to that he was vice president and general manager of the W. A. Riddell Corp.

Howard, who retired after 33 years of service as a company officer, continues as a member of the board. He was one of a group who organized the National Construction Machinery Credit Group.

Galion Allsteel appoints

Robert R. Reese has been appointed Southeastern regional sales manager for the Galion Allsteel Body Co., Galion, Ohio. Reese will supervise the sale of Galion Allsteel products.

Frank Hough retires from firm he founded

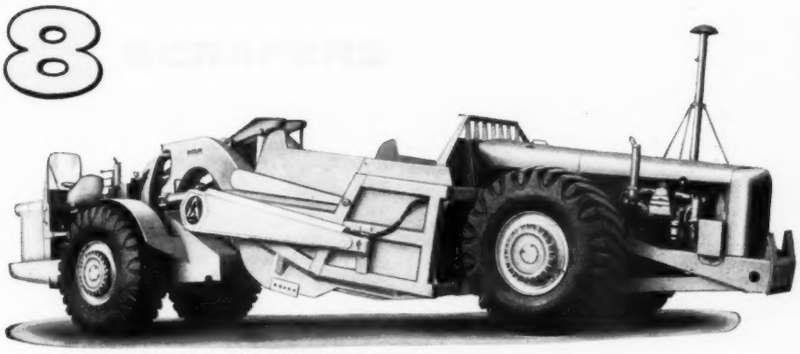
Frank G. Hough, founder and chairman of the board of the Frank G. Hough Co., Libertyville, Ill., has retired. A pioneer in bulk material handling and tractor-shovel fields, Hough incorporated his company in 1933. For several years the new firm subcontracted manufacturing. Independent facilities were established in 1939, the same year the Payloader was introduced.

Mr. Hough, who hopes to remain in manufacturing of some kind, has opened an office in Libertyville.

ne of JOB-PROVED earthmovers

Three types of scrapers with struck capacities of 7 to 24 yds.—9 to 32 yds. heaped ... 143 to 518 total h.p. ... standard gear transmissions and Torqmatic Drive ... hydraulic lever action of bowl, apron and ejector ... overhung engine scrapers have struck capacities of 7, 12 and 18 cu. yds. ... 4-wheel tractor models carry 12, 18 and 24 yd. payloads struck.

8



Twin-Power models have ... and 24 yd. struck capac- ... –25 and 32 yds. heaped ... two engines, each with ... separate Torqmatic Drive for ... tractor and scraper axles ... 436 and 518 total h.p.

4

Struck payload capacities of 13, 17 and 25 yds.—19 to 38 yds. heaped ... 218 and 300 h.p. ... Torqmatic Drive and standard gear transmissions ... loaded speeds to 34 mph. ... overhung engine Model S-12 has 13-yd. struck capacity.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Newton H. Willis, new vice president of the Waukesha Motor Co.

Waukesha vice president

Newton H. Willis has been named vice president of the Waukesha Motor Co., Waukesha, Wis. Willis joined the firm in 1930 as a design and engineering draftsman, and three years later began work in the newly-formed Railway Division, then known as the Refrigeration Division, progressing to the post of general manager.

Recently, Willis directed the development of the line of heavy-duty engine-driven electric generating sets known as Waukesha Industrial Enginators.

A-C appoints Holloway manager of dealer sales

The Construction Machinery Division, Allis-Chalmers Mfg. Co., Milwaukee, Wis., has created a new department within the sales department, and appointed V. M. Holloway

V. M. Holloway, head of the new division of the sales department of Allis-Chalmers Mfg. Co.

head of the new department.

J. M. Haile, formerly eastern territory manager of the division, replaces Holloway as assistant sales manager. K. A. New, who succeeds Haile, was the division's district manager in the metropolitan New York area.

Gardner-Denver elects three vice presidents

George W. Gutekunst, C. H. Rieman, and Brice D. Maddox have been elected vice presidents of the Gardner-Denver Co., Quincy, Ill. Gutekunst, a member of the firm for 20

George W. Gutekunst, newly elected vice president for the Gardner-Denver Co.

years, has served as salesman, district manager, and is now general sales manager.

Rieman, general manager of the firm's Denver plant, was also a salesman, district manager, and sales manager. Maddox, who was appointed general manager of the firm's Keller Tool Division last year, was materials control manager and manager of employee relations for Keller Tool Co. before it merged with Gardner-Denver in 1955.

←For more facts, circle No. 210

Economy in quarry operation achieved with joint venture

Supplying the plant with rock was this drilling, loading, and hauling setup. The Gardner-Denver wagon drills are putting down 2⅜-inch holes to a depth of about 16 feet. Loading the Euclid 9-yard rear-dump is a 2½-yard shovel.

Economy in a quarry crushing-screening setup was achieved when a general contractor and his paving subcontractor went into a joint venture to produce more than 320,000 tons of aggregate for the hot-mix paving of a 13½-mile stretch of the new Massachusetts Turnpike.

The general contractor, S. J. Groves & Sons Co., New York, N. Y., and the paving subcontractor, Alexander Construction Co., Inc., Minneapolis, Minn., set up and operated the plant, which Pioneer Engineering Works, Inc., Minneapolis, Minn., designed and furnished.

Blasted rock, delivered from the nearby quarry by a fleet of Euclid 9-yard rear-dumps, was first dumped to a 42×16-foot feeder leading to the Pioneer jaw crusher that was powered by a Caterpillar D-364 diesel engine. Leaving the crusher, the rock was deposited on a 120-foot-long inclined conveyor belt, 36 inches wide, which end-dumped to the surge pile.

The surge pile completely covered the apron feeder and the 8-foot-diameter reclaiming tunnel that fed the 30-inch-wide ×120-foot-long tunnel conveyor belt. This belt deposited all reclaimed material onto a 5×12-foot Pioneer Mesabi single-deck vibrating screen having 3¼-inch openings. Rock running off the screen was transferred by chute to a Symons 4¼-foot cone crusher that reduced the material to about a 2-inch size before depositing it on a third belt. The Symons crusher set-up was also powered by a Caterpillar D-364 diesel.

Material passing the screen was caught in a hopper, passed through a chute, and finally deposited on the same conveyor belt running under the cone crusher. This inclined belt, 30 inches wide and about 140 feet long, carried the rock passing the Mesabi screen as well as the crushed oversize to two sets of triple-deck Mesabi screens.

Oversize rock, running off the top 5×12-foot decks having 2¼-inch openings, was deposited by chutes in a Symons 4-foot cone crusher for further reduction. A 24-inch-wide, 70-foot-long return feed belt re-deposited the reduced stone, through a transfer spout, onto the 30-inch main conveyor feeding the triple-deck screens. A third Caterpillar D-364 diesel engine powered the crusher at this point.

Rock running off the second screen, which had ⅞-inch openings, was deposited in two of the four 21-yard bins and classified as 2½-inch stone. Rock passing the ⅞-inch screen, but retained on the No. 4, was deposited on a 24-inch-wide, 55-foot-long conveyor belt and also in two compartments of the remaining two bins. All material passing the bottom No. 4 screen was deposited in the remaining compartments of the 21-yard bins.

The ⅞-inch to No. 4 (3/16-inch) stone, transferred by the final 24-inch belt, was end-dumped into a 5×12-foot, triple-deck Mesabi vibrating screen unit for final screening. Here the crushed stone was classified into four sizes, and each was deposited into a separate compartment of the 21-yard bins. Stone running off the top 9/16-inch screen was classified

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HUBER-WARCO COMPANY
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HUBER W WARCO

For more facts, use Request Card at page 18 and circle No. 211

A Euclid end-dumps rock to a Pioneer jaw crusher for primary crushing. The reduced rock is fed by the 120-foot-long, 36-inch-wide conveyor belt to the surge pile.

The 5×12-foot Mesabi screens separate rock into four sizes. Top-check runoff goes to a second Symons crusher and via a return feed belt to the main conveyor. Rock from the bottom screen goes to the last screening unit for final classification.

⅞-inch, stone off the middle ⅜-inch screen was classified ½-inch, stone off the bottom 3/32-inch screen was classified ⅜-inch, and all the material passing the bottom 3/32-inch screen was classified as sand.

This Pioneer crusher plant produced the three sizes of stone—⅞-inch, ½-inch, and ⅜-inch, as well as sand, at a rate of 350 tons per hour. This material was used to supply the Barber-Greene 6,000-pound-per-minute asphalt plant that turned out the asphaltic concrete for the turnpike pavements.

Quarry operation

Supplying the Pioneer crushing and screening plant with blasted rock was a quarry pit located about a half mile from the plant. Seven Gardner-Denver wagon drills, equipped with 2⅜-inch-diameter carbide-insert drill bits, were used to sink 16-foot deep holes on a 5×6½-foot spacing. Wagon drills were powered by three Ingersoll-Rand 600 cfm air compressors.

The bottom four feet of the drill holes was loaded with 75 per cent strength Atlas gelatin and from here to within 5 feet of the top of hole, 60 per cent Atlas Extra dynamite was used.

Two shovels, including a Bucyrus-Erie 38-B with a 1½-yard bucket and a 2½-yard rig, were used to load the blasted rock in the rear-dump Euclids. Another crane, equipped with a 4,000-pound drop ball, broke up oversize rock after blasting and eliminated secondary drilling.

Paving operations

Paving operations started with a 5-inch penetration macadam base placed in two 2½-inch lifts. About 160,000 tons of macadam was required for the base, and the penetration rate was 1½ gallons per square yard. Then the 3-inch-thick asphaltic-concrete wearing surface was placed in two 1½-inch lifts at a width of 12 feet by a Barber-Greene paver. The first lift consisted of ⅞-inch-minus aggregate, while the top lift contained ½-inch-minus stone.

This 13½-mile, $8,320,000 project was considered one of the toughest sections of the $239,000,000 turnpike. S. J. Groves had to remove over 2,600,000 yards of earth and over 2,000,000 yards of rock, and cuts went more than 125 feet deep.

Personnel

The project manager for S. J. Groves, Sam Day, kept in touch with his superintendents and foremen via a General Electric 75-watt base station and 15 mobile radio units operating on a frequency of 30.58 kilocycles. Bud Gray was the project manager for Alexander Construction and Ed Vivant the superintendent in charge of the paving and the Barber-Greene asphalt plant. John Varner was the superintendent of the Pioneer crushing and screening plant.

Bill McQueen was the resident engineer for the consultants, Thomas Worcester Corp., Boston, Mass., on this section of the turnpike. Howard, Needles, Tammen & Bergendoff, New York, N. Y., was the general engineering consultant to the Massachusetts Turnpike Authority. THE END

39,000# digging force plus "high leverage" contour of rocker arms . . give the Eimco 105 Excavator more digging force per pound of weight than any comparative machine.

Dumping into haulage units or fills, ability to discharge without turning gives the Eimco more productive motion per unit of expelled energy than any other earthmover.

Even With 100 ft. Round-Trip Cycle

THIS EIMCO EXCAVATOR MOVES 1050 TONS IN 7 HOURS

An Eimco 105 Excavator loads out large boulders and loose overburden without the aid of preliminary shooting . . . hauls 50 ft. to the edge of a fill . . . and discharges 500 — 3-ton-loads every 50 minute work hour.

Ability to complete a cycle without turning is a big Eimco Excavator advantage, regardless of haul length. But as travel distance decreases, the 105's loading speed increases in much greater proportion than that of conventional loaders.

When trucks can be spotted a few feet behind, and with good availability . . . the 105 can complete 6 cycles per minute and toss between 600 - 800 tons of heavy rock over its back every hour.

On projects with confined working space, the Eimco Excavator's cubic yard capacity per $ of investment increases sharply while the conventional loader's value decreases. Loading in tight quarters or on narrow benches, conventional machines must maneuver "back and forth" to reach dump position. This curtails production, increases operator fatigue jeopardizes safety and "bottlenecks" hauling operations. These profit-stealing disadvantages are eliminated by the 105.

With either the Excavator or the Eimco 105 Front-End Loader (2½ yd., 40,000# break-out) you get a big mobility edge. Under full load . . at top speed . . moving forward or reverse . . both 105 Loaders respond instantly to gear reversals, high-lo shifts, independent track operation - all controlled by easy - to - operate, power - shift levers.

An Eimco Sales Engineer will be happy to conduct a time study of your operation and show you the way to more profit!

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B-270

For more facts, use Request Card at page 18 and circle No. 212

Part of the 25-unit scraper fleet kicks up dust as it works a portion of the 200-acre site of the Bowaters Carolina Corp. paper mill. The Cat DW21, left, is push-loaded by an International TD-24; Allis-Chalmers tractors help load the Euclid scrapers.

An Oliver diesel tractor pulls a sheepsfoot roller to compact the shallow lifts. Additional compaction is provided by two 50-ton pneumatic rollers and the scrapers.

Big scraper, tractor fleets keep production at peak on plant-site grading

Scraper fleet of 25 and tractor fleet of 29 make earth fly as they move 30,000 cubic yards daily on 3,000,000-yard job

(Additional photo on front cover)

by ANTHONY N. MAVROUDIS, field editor

Like the other scrapers, this Cat DW21 pushed by an A-C tractor never has to stop to turn in tight quarters on the huge site. The result: a fast loading-hauling-dumping-return cycle that moves 30,000 yards per day.

An Allis-Chalmers tractor helps start off a LeTourneau-Westinghouse Model C on a haul route that makes it possible for the heavy scrapers to give partial compaction to the shallow lifts in the fill.

Euclids predominate on the job, numbering eleven out of the fleet of 25 scrapers. The swift working pace of the scrapers, and the powerful pushers like this International TD-24 are getting the contractor off to a good start toward the April, 1958, completion date.

One of the largest scraper fleets now working has been assembled by Boyle Construction Co., Inc., Sumter, S. C., to move an average 30,000 cubic yards of earth per eleven hour day.

The smooth-running, high-production fleet, consisting of 25 rigs of 18 and 21-yard-capacity, started clearing and grading operations in April on a 200-acre tract of land near Catawba, S. C. for a multi-million dollar paper mill. This work, being done under a $1,028,000 contract for Bowaters Carolina Corp., involves moving over 3,000,000 cubic yards of material to prepare the site. The project is scheduled for completion in April.

Tractor fleet required

An equally large tractor fleet, totaling 29 rubber-tired and track-type tractors, is being used to handle the push-loading of the scrapers and the spreading and compacting of the various fills.

The scraper fleet consists of four Caterpillar DW21's, two LeTourneau-Westinghouse Model C's, six International 2T75's, two Allis-Chalmers TS-200's and 11 Euclids.

Push-loading the scrapers are three Allis-Chalmers HD-21's, four Allis-Chalmers HD-20's, three Allis-Chalmers HD-19's, two International TD-24's and a Caterpillar D9. The tractor-dozer fleet, handling the spreading, compacting, and clearing operations, consists of a Caterpillar D8, two more D8's that alternate in pulling sheepsfoot rollers, and a Browning and a Ferguson 50-ton pneumatic roller, two Oliver diesel tractors pulling sheepsfoot rollers, a

Starting to load, a Cat DW21 assisted by an Allis-Chalmers HD-20 is flanked by two Euclids. Around the clock maintenance is keeping the tractor-scraper fleet at peak performance.

One of the DW21's, pushed by an International TD-24, stays close behind the LeTourneau-Westinghouse Model C, right, and a Euclid scraper. Both the Euclid and L-W scrapers are pushed by HD-21's.

Caterpillar D7, an Allis-Chalmers HD-20, an Allis-Chalmers HD-21, and two International TD-24's. Doubling on the clearing and grading are a Caterpillar D7, an Allis-Chalmers HD-15, an Allis-Chalmers HD-16, and an Allis-Chalmers HD-20—all with rear-mounted root rakes.

Maintenance

The operation of this fleet of 25 scrapers and 29 tractors requires a top-notch maintenance force. The six mechanics on the project use two lubrication vans equipped with Alemite reels and D-A lubricants to perform daily preventive maintenance. Their jobs are largely carried on after the workday has ended.

Diesel fuel is delivered to the project at the end of every day by Marshall Oil Co., Rock Hill, S. C., and each piece of equipment is filled directly from the delivering tankers. Texaco diesel fuel is being exclusively used on the job.

Pneumatic tire repairs are handled by Miller Tire Service, Columbia, S. C., which visits the project every evening to replace any damaged tires. By using its own service truck, this Firestone dealer can replace tires quickly, bring damaged ones to its shop, and return repaired tires to the project.

This after-hour care for each scraper and tractor means that there is very little equipment downtime during the day when earthmoving production is of prime importance. Average haul distances vary from 800 to 7,000 feet, and haul routes are laid out in such a manner as to allow the rubber-tired scrapers to partially compact the shallow fill lifts.

Because of the expanse of the plant area, scrapers never have to stop to make a tight turn at the dumping and loading points. This makes for a fast loading-hauling-dumping-return cycle which enables the tremendous task force of the contractor to average 30,000 cubic yards per day.

Personnel

A. D. McCoy is the project manager, and Bill Odom, the office manager, for Boyle Construction. A General Electric mobile radio unit, with the base station located in an abandoned house used as the field office, is used by McCoy or Odom to contact field personnel using six mobile sets scattered throughout the project.

THE END

For more facts, circle No. 213→

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Crane Carrier Corporation manufactures custom-tailored vehicles, designed to meet your individual requirements for off-highway service. CCC engineers will be glad to work with you on any of your hauling problems.

Modern-day compaction methods

Various types of machines available for every type of soil; use of vibrating and multiple-shoe vibrating type makes gain

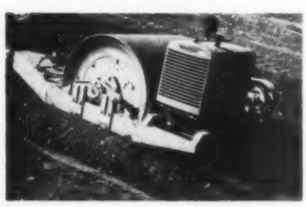
by A. O. WILLIAMSON
Mgr., Road Machinery Div.
Bros, Inc.

Compaction's great influence on the behavior of soils for embankments, subgrades, and subbases has led to a constant, diligent study and evaluation of the various types of compaction equipment and methods used. Much of the progress made in this field must be credited to such agencies as the Highway Research Board, the American Association of State Highway Officials, the Waterways Experiment Station of the U. S. Army Corps of Engineers, and various cooperating equipment manufacturers.

The importance of proper compaction in all phases of road construction cannot be overestimated because it provides the greatest long-term economy in the road itself. In a building, a poor or improper substructure will cause the eventual destruction of the building itself; so it is with embankment, subgrade, base, and surface construction; it must in all ways be adequate to the loads to be supported. Thus, the selection of the proper compaction equipment and methods is vital in producing the long-term economies expected and desired.

It is in this last respect that our attention turns to the many important aspects of soil mechanics and compaction principles which will affect the selection of the proper equipment and method for compaction.

Compaction, simply defined, is a mechanical effort to compress soils into consolidation, to reduce void spaces between soil particles whether such voids be water or air or a combination of both. This effort is necessary to prevent the settlement of soil under the pavement which would otherwise be caused by heavy traffic loads and natural settlement over a period of time.



A 3½-ton vibratory roller combining dynamic and static compression.

Other values which accrue with proper compaction are improved load-bearing values, the minimizing of water movement and volume change, and an increased resistance to the action of frost. How these factors are influenced by various compaction equipment and methods can be readily seen.

It is well known that various soils react differently to the type of compactive efforts being used. For example, in the broad range of soils between heavy clays and well-graded sands, the dry density obtained by one type of compaction could well vary from 60 pounds per cubic foot to 135 pounds per cubic foot. Yet in the high range of either of these variations, an increase in density of only 3 to 5 pounds per cubic foot could increase load-bearing values several times. And obtaining these small but important increases in density economically is a matter of selecting the right equipment or combination of equipment.

Establishing the proper density for a given soil type is a matter of laboratory procedure called the Proctor Method. This determines the opti-

From New Orleans to Ketchikan
"Small" CAT* Diesel Tractors
Lick "Big" Jobs

Caterpillar D4 and D2 Tractors, for their size and weight, are as rugged machines as ever wore yellow paint. There are hundreds of jobs they can do just as efficiently as their bigger brothers. And contractors are proving it.

The four tractors shown here are working in localities as far apart as Alaska and Louisiana, and none of them is on an easy job. One owner, John Hannigan, of Philadelphia, puts it this way: "They're tough. I'd never buy anything else. They'll outwork other makes any time and any where. The only repairs I've made on this D4 in three years were adjustments to the main clutch, tracks and steering brakes."

Both the D2 and the D4 are built to handle the tough jobs, right up to their capacity, all day long and month after month. Yet they're small and compact enough to work in cramped quarters—tunnels or narrow city streets. Both are economical to operate, and maintenance costs are consistently low, because they *quality* built to stand up under punishment. Their pendable Caterpillar Engines have flywheel capaci of 48 HP for the D2 and 63 HP for the D4.

Let your Caterpillar Dealer show you how one these smaller Cat Diesel Tractors will fit into your c struction work and save you money. He backs th long work life with reliable service and Caterpil parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S.

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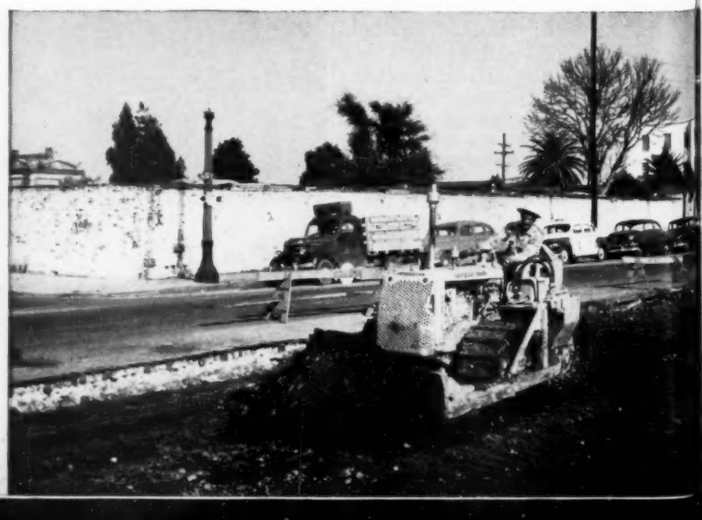
NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE

NEW ORLEANS

Taking the "blues" out of Basin Street, this Cat D2 Tractor, owned by Boh Brothers Construction Co., New Orleans, La., is helping widen the famous thoroughfare to 44 ft. on each side of a center parkway. Old St. Louis Cemetery shown in background.



This is the fourth in a series of seven feature articles, each complete in itself, on various aspects of roadbuilding. The articles were written specially for the ROAD SHOW DAILY, published by CONTRACTORS AND ENGINEERS magazine during the 1957 Road Show. They are being reprinted here, by request, for those who missed the Road Show. Each of the articles was written by a key figure in the roadbuilding industry.

A multiple-shoe vibratory compactor. Each shoe or workhead delivers 4,200 blows per minute to the material being compacted.

mum moisture content for the soil at which it will respond to the compactive effort to the greatest degree. Having arrived at the proper moisture-density relationship, field compaction tests are made on trial lifts to ascertain what thickness of lift and what equipment can achieve the desired road density most economically.

Because increased densities were sometimes required, particularly in airfield compaction, the Proctor Method had to be modified; presently both laboratory standards are in use.

Besides the various types of soils, moisture content also plays an important role in the selection of compaction equipment. Each compactive effort has a corresponding optimum moisture content and maximum dry density. For example, heavy clays can be compacted through a wide range of moisture content below optimum with relatively small changes in density; by contrast, well-graded materials, producing high densities under the same compactive effort, react sharply to small changes in moisture content and produce marked changes in density.

In a specific case, a considerably greater compactive effort is required to increase the density of a clay soil from 90 to 95 Proctor than is required to produce the same density in a well-graded sand. To explain a compactive effort—it is the amount of drawbar pull produced by the weight of the roller and the number of passes over an area made by the roller; lift thickness, contact pressure, and—with sheepsfoot rollers—the size of the tamping feet also contribute to the effort. To vary the amount of this effort, different sizes and types of rollers can be used. The number of passes and thickness of lifts can also be varied.

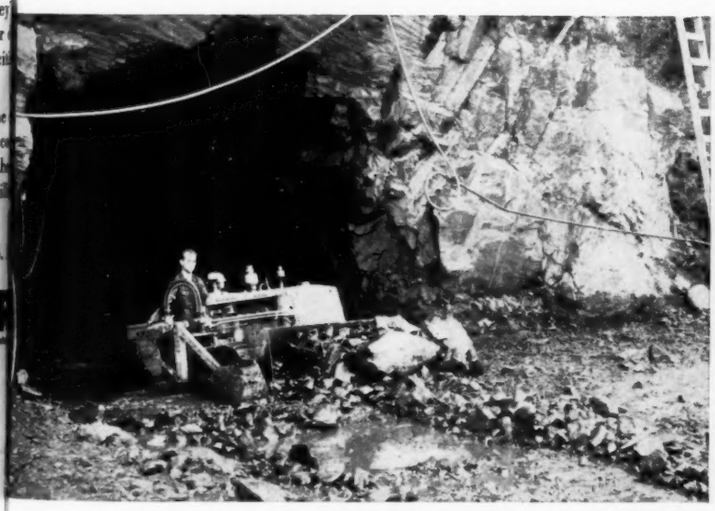
In relating the type and weight of a roller for a given soil, the most economical performance is by the roller which gives the best economy between contact pressure and lift thickness. Contact pressure, however, is limited by the bearing strength of the soil being compacted and should be determined by trial lift compaction. The final question, then, is which type of compaction equipment will produce the maximum limit of dry density with rea-

Three-wheel tandem uses transfer-of-weight principle for rolling high spots.

←For more facts, circle No. 214

TORONTO

Poce Construction Co., of Toronto, Ont., owns this D4 with No. 4A Bulldozer, shown 'dozing fill into a bend of the Humber River. This is a diversion job, digging a new channel to prevent flooding, and moving the earth into the old river bed.



KETCHIKAN

The D2 helped Manson-Osberg Co. in the construction of a 7 ft. x 8 ft. hydroelectric tunnel through granite rock near Ketchikan, Alaska. Equipped with scrubbers, the tractor worked the whole length of the 4000-ft. tunnel, moving out over 1000 cu. yd. of rock.

PHILADELPHIA

Here the D4, owned by Contractor John Hannigan, rips up old concrete foundations and rough grades for a new driveway and parking area at one of the Penn Fruit Co. supermarkets, in Philadelphia, Pa.

(*Continued from preceding page*)

sonable economy for specific types of soils at optimum moisture content. Here we can review the different types of compaction equipment available and in use today.

Sheepsfoot rollers

Sheepsfoot rollers are the most common type of compaction equipment being used. They are manufactured in diameters from 40 to 72 inches, ranging in weight from 6,000 to 60,000 pounds when loaded with wet sand. Variations in drum width, area, shape, and number of feet and foot spacing make the sheepsfoot roller of value for various types of compaction, although it is most efficient in compacting fine-grained soils. Less efficiency is experienced using it in granular soils. In compacting, there is a pulverizing effect on the soil which is sought in some instances.

A pair of sheepsfoot tamping rollers compacting subgrade material.

The contact pressure of the tamping feet determines the amount of compaction which will be obtained by the sheepsfoot roller; this contact pressure is a product of the roller weight divided by the total area of one row of tamping feet. It should be as large as possible, but cannot exceed the bearing capacity of the soil being compacted. In such a case, the roller would sink into the soil until enough adjacent feet on the roller drum or the drum itself had come in contact with it to reduce the maximum contact pressure to that which the soil's bearing capacity would sustain.

For example, during the first pass of a sheepsfoot roller over a lift of loose soil, the feet penetration is quite deep, but as additional passes are made, the density, and thus the bearing capacity, of the soil increases. The tamping feet then penetrate less and eventually "walk out" as the specified dry density is reached.

As noted, this type of roller performs best in cohesive soils. However, it can also produce a larger amount of air voids than smooth-wheel or pneumatic-tire rollers do in this material. These air voids increase the tendency in subgrade materials to absorb water.

As opposed to other rollers, the sheepsfoot compacts from the bottom of the lift up. Thus, it is desirable that tamping feet be at least as long as the thickness of the lift being compacted. Although the coverage area of the tamping feet is relatively small, there is an immediate spread of the total compression pressure.

A recent development in sheepsfoot roller equipment is a level blade attachment fastened directly to the roller. The blade levels the materials spread by scrapers and controls the lift uniformly. This combination not only eliminates the need for a patrol grader on the grade, but helps produce a more uniform compaction of the materials. It was noted that in using this combined equipment in a clay soil, the roller with a foot pressure of 178 psi produced equal or greater densities than another sheepsfoot roller with a foot pressure of 750 psi which was not so equipped. Maintaining an even, uniform lift is clearly significant in the process of developing maximum densities with sheepsfoot rollers.

Pneumatic-tire rollers

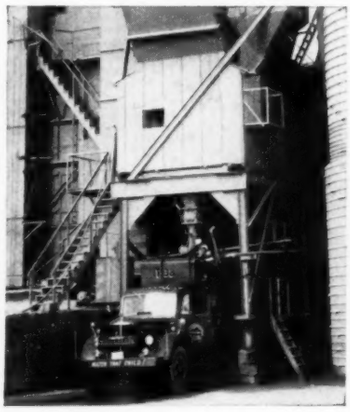
Pneumatic-tire rollers are used in compacting all types of soils, provided that the values of contact pressure and wheel load are proper for the soil being compacted. This type of roller is quite flexible because the wheel load can be varied by the amount of ballast used and the contact pressure can be varied by changing the inflation pressure of the tires.

A self-propelled steel-wheel roller equipped with segmented rolls.

Pneumatic rollers are generally divided into three classes: medium, heavy, and super-heavy weight. The medium class is considered to include rollers up to 13-ton rolling capacity, both tow-type and self-propelled models. The heavy class covers the range beyond the medium weight up to 50-ton units. In the lower range of this class, there are self-propelled models, but presently most rollers in this class are tow-type. The super weights include rollers up to 200-ton capacity; these are used primarily for airfields and test rolling.

All of these rollers have ballast boxes which can be filled with the cheapest materials available to obtain compaction load; water and/or sand are most frequently used, but in the giant rollers, pig iron is most often used to achieve maximum load.

The wheels on pneumatic-tire rollers are arranged to distribute equally



1 Ready-mix driver secures load at base nearest his most recent job. Radio tells him where to deliver load.

HOW ONE MAJOR CONTRACTOR CUT OPERATING COSTS WITH BENDIX DYNA-COM RADIO

Harry T. Campbell Sons' Corporation finds two-way radio boosts efficiency, eliminates delays

Two-way radio has brought about revolutionary changes in the construction business. And they're all to the good, according to Harry Campbell, Jr., of Harry T. Campbell Sons' Corporation, Baltimore, Md. The Campbell organization, a major construction and transit-mix company, has a national reputation as the largest manufacturer of Sakrete, a widely used brand of mix-it-yourself concrete.

"The efficiency of our operation has really zoomed since we installed Bendix* Dyna-Com Two-Way Radio," says Mr. Campbell. "We've cut out this constant movement on the part of foremen and superintendents; they can spend more time where they're really needed! We've cut waste movement, and, what's more important, we've materially reduced operating costs. We wouldn't ever be without it again."

Of course, that's only a small part of the difference Bendix Two-Way Radio makes. As Mr. Campbell will happily testify, Bendix Radio is an absolute necessity where working sites are changed frequently, especially when they're at considerable distance from field headquarters. With Bendix Two-Way Radio every phase of the construction business is speeded up. Downtime is slashed to the absolute minimum. When a vehicle needs repairs, the necessary help can be on the way within minutes. It gives the dispatcher—and through him, the boss—absolute control of every phase of the operation. It almost literally enables him to be on the scene *at every spot* where work is being done, even on vast, sprawling dam jobs or highway projects extending over many miles.

In the ready-mix field Bendix Two-Way Radio is a must. When there is an over-supply at one location, a change in delivery schedule, a breakdown or a mired truck—the situation can be corrected immediately. There's no dumping of expensive loads, no costly chipping jobs . . . and no time-consuming search for a telephone.

Whatever your function in the construction or ready-mix field, you'll find that Bendix Two-Way Radio pays for itself within months. Write for further information. Our trained technicians will be glad to tell you how Bendix Dyna-Com Two-Way Radio can help make your operation more efficient.

*REG. U.S. PAT. OFF.

the compaction load, regardless of ground profile. In the medium class, most rollers have smooth, wide-face tires which provide overlap between front and rear wheels; thus, 100 percent coverage is assured on each pass of the roller. Since these rollers are most used for compaction in the shallow lift range, the secondary action of the roller wheels is also important. This action is wheel oscillation which provides each wheel with an up-and-down motion, allowing the roller to follow the cross section of the ground contour closely, thereby rolling out voids and soft spots. Besides this, some rollers also have a wobble-wheel action which provides a weaving, kneading motion under the wheel, tending further to contribute to the proper positioning of soil particles to eliminate the voids mentioned earlier.

Rollers in this class are at present built in widths up to 95 inches. They obtain efficient and satisfactory compaction while being towed at speeds up to 15 mph. Pulling power can be supplied by truck or rubber-tire industrial-type tractor. Recently, contractors have started to tow two and three of these rollers behind one tractor to achieve specified densities in the quickest possible time and at greater economy.

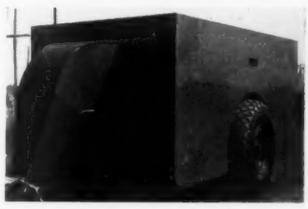
Also in the medium class is the self-propelled pneumatic-tire roller, which has gained considerably in use and application in the past two years. The obvious advantages of such a roller over the tow-type are in eliminating the need for a towing vehicle and in the time saved by rolling back and forth over the same course without having to turn around. Too, in restricted areas, where turnaround is necessary, it is more easily accomplished. It has been noted that some self-propelled rollers with sufficient horsepower can also tow another roller to speed compaction, but the roller sizes are the factor.

Trench rollers are used in such operatoins as pavement widening.

Since the introduction of the self-propelled roller, its use on city street asphalt surfacing, resurfacing, and seal coating has become very prevalent. The unique action of a pneumatic-tire wheel tightly knits the asphalt-surface materials together, preventing minute voids which might eventually become serious pavement failures. This flowing pressure which kneads the surface materials is actually more important than the roller's static weight for "setting up" the materials properly.

Stabilization projects where cement, salt, calcium chloride, or other stabilizing agents are mixed with soil use the rollers in this class for obtaining proper densities.

Increasing emphasis has been given recently to the development and use of tow-type and self-propelled pneumatic-tire rollers in the 13 to 30-ton range. Undoubtedly, more consideration will be given to this size equipment, particularly in view of such tests as those conducted in 1956 by the Waterways Experiment Station. These tests indicated that compacting in 6-inch lifts produced



A superweight 50-ton pneumatic-tire roller used for earthfill compaction.

laminations, even though the top of each lift was scarified before adding the next one. This lack of bond, of course, would not be a factor to consider if lifts were compacted in greater thicknesses. However, now most specifications permit compaction of lifts only between 6 and 8 inches in thickness.

As for the super-weight rollers, they are primarily of the chariot type. The compaction of airfield embankments has been particularly sensitive to the modern needs of supporting extremely heavy wheel loads. Since 1942, projects such as this have taken the lead in the development of super load compaction equipment in the weight range from 50 to 200-ton capacity. The advantages of this class of roller are in the compaction of lifts up to 24-inch thickness and the elimination of voids in embankment materials which, by their presence, would present a serious hazard to large, heavy aircraft.

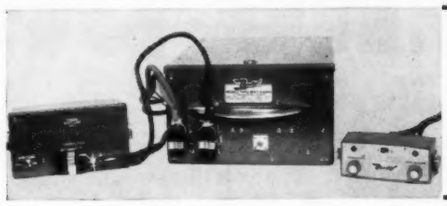
These rollers also have wheel oscillation, and it is accomplished by various manufacturers in different ways. Oscillating axles are used by some to permit a high degree of wheel oscillation. On another type, individual ballast boxes are mounted over each huge wheel to equalize wheel loading and joined together by a single yoke for stability and towing. Another type effects this action with a system of cables and pulleys. For wheel-load testing of airfields, most of these rollers can be used with

(Continued on page 28)

2 Driver is on his way to job with load when he is reached by roving supervisor, who has recently visited job.

3 Supervisor tells driver there is no need for additional concrete at original destination, directs him to other nearby job.

4 Driver arrives on scene of new job, just at time concrete is needed. Long delay is eliminated by use of Bendix Two-Way Radio.



Bendix Quiet-Line unit, far left, can be plugged into any 25-54 mc. Dyna-Com Mobile unit. It banishes noise of crowded frequencies, shuts out all messages but yours. Provides optional tone-coded or conventional squelch operation.

Bendix Radio Division

Mobile Radio Sales • Baltimore 4, Maryland

Bendix AVIATION CORPORATION

For more facts, use Request Card at page 18 and circle No. 215

Work Bulls pay off

on every construction project

Work Bulls provide the *right* tractor power with design-integrated attachments to build profit on these and scores of other jobs!

42 hp — DAVIS PIT BULL

(far left) **is equipped with hydraulically controlled ⅞-yd. loader. Broom, blades, swinging crane or fork lift can be mounted on same loader frame and arms. The Pit Bull features a torque converter and combination foot feed and reversing clutches as standard equipment.**

34 hp — WORK BULL MODEL 202

(center) **with rear-mounted post hole digger that digs perpendicular holes even when working on slopes. PTO driven, the attachment can be used with either 8 or 12″ augers. Other rear-mounted attachments include the Model 185 backhoe, reel and rotary mowers, multi-purpose blade and a pipe and cable layer. Front-mounted attachments include loader, blades, broom and fork lift.**

52 hp — WORK BULL MODEL 404

(left foreground) **is biggest, most powerful tractor in line. Available with gasoline or diesel engines it has five forward speeds and optional power steering. Model illustrated is equipped with low, direct-thrust ¾-yd. loader and a fingertip-operated hydraulic backhoe which handles 12 to 36-in. buckets, digs to depth of 12½ feet.**

...as primary equipment

Work Bulls put former hand work on a paying power basis. With five tractors (34 to 52 hp)—choice of 20 *switch-in-a-smoke-break* attachments — Work Bulls pay off on small, scattered work-and-run jobs . . . earn their keep off-season, too, removing snow or handling other similar jobs.

...as backup machines

With Work Bulls you get the exact power/equipment cost ratio the job demands . . . increase equipment scheduling efficiency . . . cut down overhead. Work Bulls move from site to site through city traffic or cross-country . . . without permit troubles, without flatbed and other costs.

...as utility or cleanup tools

When you're using shovels to clean up spill in the loading area, scrapers to smooth out haulroads, crawler dozers to pull wagons or skid light and medium-weight machinery—there's a profitable place for Work Bulls on your job. In fact Work Bulls help make your "big stuff" more profitable.

Work Bulls have a profitable place on every project. Check to see which of the 5 tractors (34 to 52 hp) and 20 easily interchangeable attachments you need. Write for free 24-pg. catalog and the name of your Work Bull distributor.

M·H·F WORK BULLS

Division of Massey-Harris-Ferguson, Inc.

12-G Quality Avenue **Racine, Wisconsin**

For more facts, use Request Card at page 18 and circle No. 216

(Continued from page 25)

A 9-ton self-propelled roller towing a 13-ton unit compacts subbase on a stretch of roadway. Both units are rubber-tire compactors.

a pair of wheels instead of the usual four.

Steel-wheel rollers

Steel-wheel rollers have long played an important part in road construction, and are acknowledged to be the oldest form of mechanical compaction known. Recent technical advancements have made the performance of these rollers smoother and faster. Present models range in size from small self-propelled patching rollers up to the 18-ton tandem-wheel type. These larger models are applied on all types of soil except clean non-plastic sands. Lifts over 12 inches can be efficiently compacted, especially in friable soils; in clay soils, control lifts must be exercised so that compaction is not limited to the upper crust of the lift. These rollers are particularly valuable in compacting gravels, sands, crushed rock, and other materials where a crushing action is needed.

In some of these rollers, the steering and trailing rolls can be ballasted to vary range of compression per linear inch of roll width. One of the most recent in this class is the 3-axle tandem roller that utilizes the transfer-of-weight principle. This design shifts compression weight to the high spots on a road surface when all rolls are locked on the same plane. The rear guide roll can be unlocked to float vertically, providing additional compaction effort. Besides earthwork compaction, these rollers are in wide use for grade-finishing and asphalt-finishing work.

Vibratory rollers

Engineers and contractors are watching the performance of vibratory rollers with interest as they come into wider usage. One type of this roller combines static loading, as experienced with standard compaction equipment, and dynamic compaction loading, which is produced by an out-of-balance weight. This vibrating force can be varied to some degree in some vibratory rollers to apply a greater compaction load.

In principle, the vibratory forces are transmitted in all directions to the soil. Friction between particles is thus reduced and their relocation at greater depths is facilitated.

These rollers vary in size from 1½ to 50-ton capacity and include both steel-wheel and pneumatic-tire models. Soils which are good conductors of vibration—particularly cohesionless soils—are quickly compacted to specified densities in the minimum number of passes. A specified density of 100 per cent standard Proctor has been obtained at a 24-inch depth in two passes by a 3½-ton vibratory roller. It appears, however, more experience, will have to be gained with this type of roller before its real value can be properly assessed.

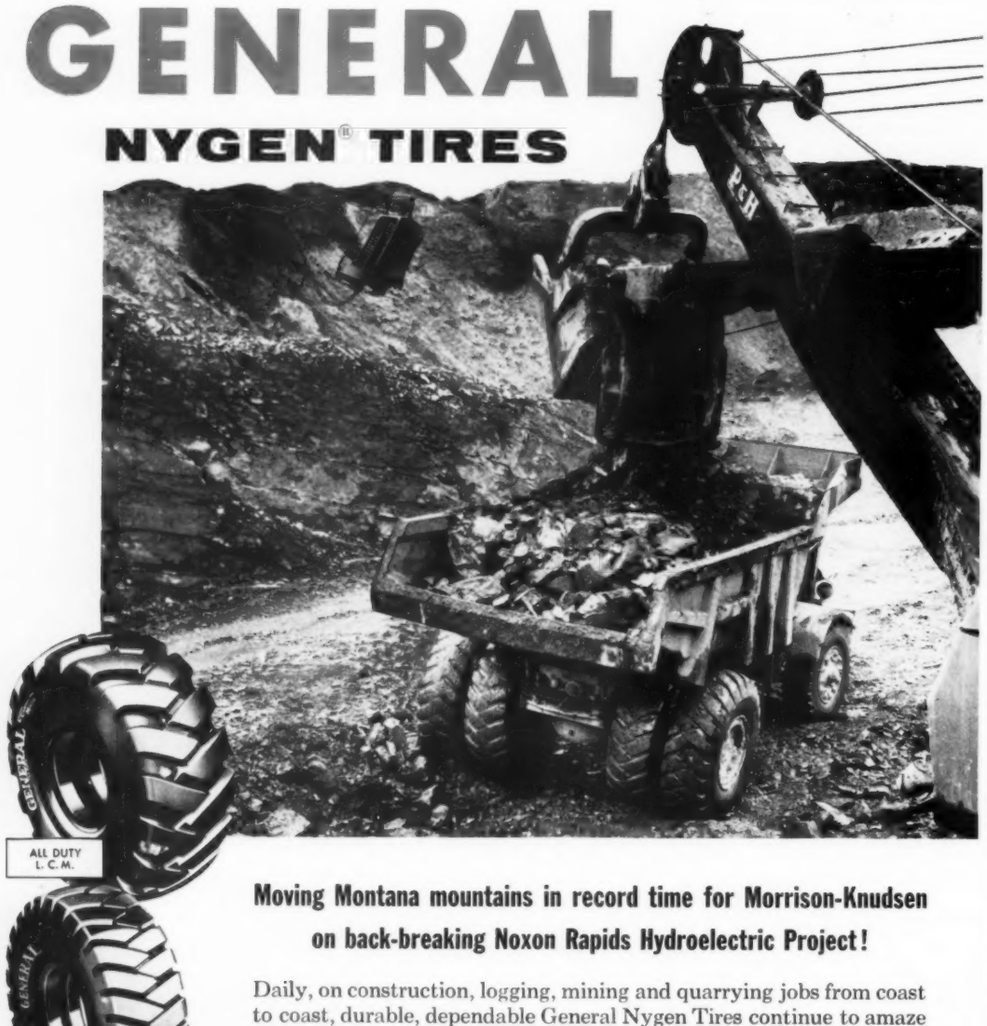
Another type of compactor which utilizes the vibratory principle is the multiple-shoe vibrating type. Shoes or workheads are mounted in multiples and can be varied to meet different width requirements. Each workhead delivers 4,200 2-ton blows per minute to the material being compacted. Compressed air is supplied to the workheads by hoses from a compressor on the tractor. A special feature of this equipment is the independent suspension of each workhead, which permits shoulder compaction to be accomplished simultaneously with work being done on the roadbed. Particular efficiency in obtaining maximum densities in granular soil materials has been reported with this type of machine.

Other rollers

The grid roller is a multi-purpose unit which is used for earthfill compaction; processing old blacktop; and

GENERAL

NYGEN® TIRES



ALL DUTY L. C. M.

LOGGING CONSTRUCTION MINING

DUAL TRACTION LUG

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TRACTOR GRADER

Moving Montana mountains in record time for Morrison-Knudsen on back-breaking Noxon Rapids Hydroelectric Project!

Daily, on construction, logging, mining and quarrying jobs from coast to coast, durable, dependable General Nygen Tires continue to amaze veteran fleet operators with their ability to cut costs and increase profits. Built tougher with Nygen Cord for the toughest jobs, General Nygen Tires can save you time and money starting today! Why not let them?

specify GENERALS *on new equipment*

THE GENERAL TRUCK TIRE

THE GENERAL TIRE & RUBBER CO. • Akron, Ohio

For more facts, use Request Card at page 18 and circle No. 217

Truck axle rides on air, needs no leaf springs

A hollow axle able to withstand up to 16 times more twisting force than a regular axle will make it possible for truck drivers literally to ride on air, according to an announcement from the GMC Truck & Coach Division of General Motors Corp.

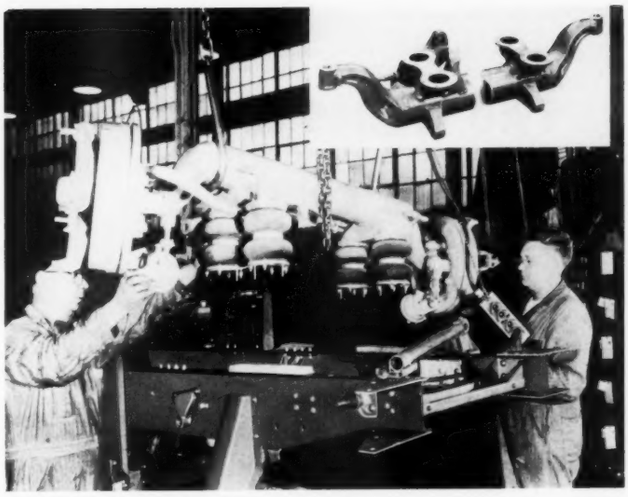
The tubular axle contains compressed air for operating the front assembly of GMC's truck air suspension system in which air bellows take the place of regular leaf springs. It is used in the air suspension system of 10 basic air-ride truck models now in production by GMC.

The axle is 6 inches in diameter and holds 1,000 cubic inches of air. It links two rubberized air bellows on each side of the truck frame.

When the truck hits a bump, the air in the bellows contracts. This compresses the air inside the axle, cushioning the impact and giving the truck and its load a smooth, comfortable ride. Beam-like air reservoirs do the same in the rear.

According to the manufacturer, the hollow axle has about one-fifth the deflection of a regular assembly, and its 5/16-inch steel walls give it an 11,000-pound load rating.

Under full load, air pressure in the axle reaches about 100 pounds. When the vehicle is empty, it drops to about 65 pounds. Leveling valves meter the air into the bellows and axle, and automatically balance air pressure with load weight.



GMC truck axle that rides on air, needs no leaf springs.

(*Continued from preceding page*)

crushing bank run, native, or oversize materials. These towed units, when ballasted with cement, can produce pressures of over 300 pounds per linear inch of drum width.

Another type of roller recently introduced is a 4-wheel self-propelled roller with segmented rolls. This design produces an interrupted compression pressure which directs compaction effort downward. Various types of combination pneumatic-tire steel-wheel rollers have also come into use in the past year. These vary in size between 9 and 20 tons and are self-propelled. These have achieved satisfactory results on earthfill and asphalt compaction work when tire pick-up is properly controlled—an important factor.

There are special types of machines which facilitate compaction work where standard-type equipment will not provide efficiency and economy. One of these is the trench roller, of special importance in widening pavements, superelevating curves, and various types of new construction work. The compression roll can be adjusted vertically to work at any depth to 25 inches. Its compaction effort ranges from 300 to 375 pounds per linear inch of roller width.

Manual vibratory tampers are in considerable use for compaction around bridge abutments, walls, and other areas which are inaccessible to standard equipment. This type of equipment performs in both granular base materials and asphalt surfaces, producing up to 750 square yards of compaction per hour. Vibratory power is supplied by gasoline engine or compressed air in various models.

These are some of the major types of equipment which have improved compaction procedures and results in recent years. No mention has been made here of the innovations in processing roadbed materials such as pulverizing, mixing, blending, and other types of manipulation; yet these measures, along with the proper compaction equipment, are increasing in use for the ultimate purpose of providing greater load-bearing values and less maintenance in the completed highways and roads. THE END

HIGHWAY

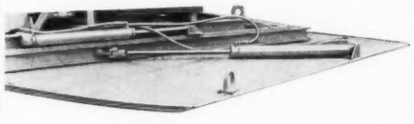
Announces

THE

SPOTTER-BASE for Highway Skid-Mounted Earth-Boring Machines

Hydraulic positioning

A hydraulic positioning ram controls auger travel across the rear of the truck body.



. . . hydraulic positioning in an 80" arc, extends 22"
. . . digs holes 9" to 36" in diameter up to 10 feet deep.

The Spotter-Base is your answer for versatile, fast, easy digging. This unit spots the hole, eliminating constant maneuvering of the truck during digging and pole setting operations. The Spotter "reaches" over digging obstructions and can shift digging direction should an underground obstacle be encountered.

Finger-tip controlled hydraulic positioning allows the operator to position the boring machine within an arc of 80 inches — and extend the unit 22 inches from platform. The Spotter will dig at any point within this arc and within the forward and aft traverse. The boring head and intermediate case are equipped with a leveling mechanism. This is combined with the new Spotter-Base to provide extreme digging flexibility. The Spotter can be mounted on a single axle or tandem truck.

HIGHWAY

A Division of Merritt-Chapman & Scott Corp.

UTILITY DIVISION
HIGHWAY TRAILER COMPANY
HEADQUARTERS: EDGERTON, WISCONSIN
Manufacturers of: Public Utility Bodies • Earth-Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-offs • Service Accessories • Commercial Trailers • Trailerized Tanks and Dry Bulk Haulers
SALES AND SERVICE IN PRINCIPAL CITIES

For more facts, use Request Card at page 18 and circle No. 218

Two cranes team to place concrete for ammo magazines

A Lima Model 34 ¾-yard truck-crane on a Dart carrier gets ready to pick up a bucket of concrete that will be deposited on a platform near the center of the structure by the Lima 604. Both the truck-crane and crawler have 60-foot booms, and the former also uses a 15-foot jib.

Working in close cooperation from opposite sides of ammunition magazines, two cranes handled tremies and buckets over a 38×75-foot area as they placed cell walls for the facilities. On part of the 240-cubic-yard pour, one of the cranes raised the buckets to a platform at roof level so that the other crane could pick them up and swing them to more distant wall sections.

This type of operation was one of the things making for efficiency during construction of the facilities at Wurtsmith Air Force Base near Oscoda, Mich. These storage structures, together with auxiliary buildings, protective barricades, access roads, and other facilities, constituted a $1.25 million construction project for which A. J. Etkin Construction Co., Oak Park, Mich., was the general contractor. The project was designed by the U. S. Army Corps of Engineers and supervised by the Detroit District of the Corps.

Located in a remote area of the base, well removed from other activities, the new facilities will provide for the storage and handling of the ammunition used by the fighter-interceptor planes stationed at the base.

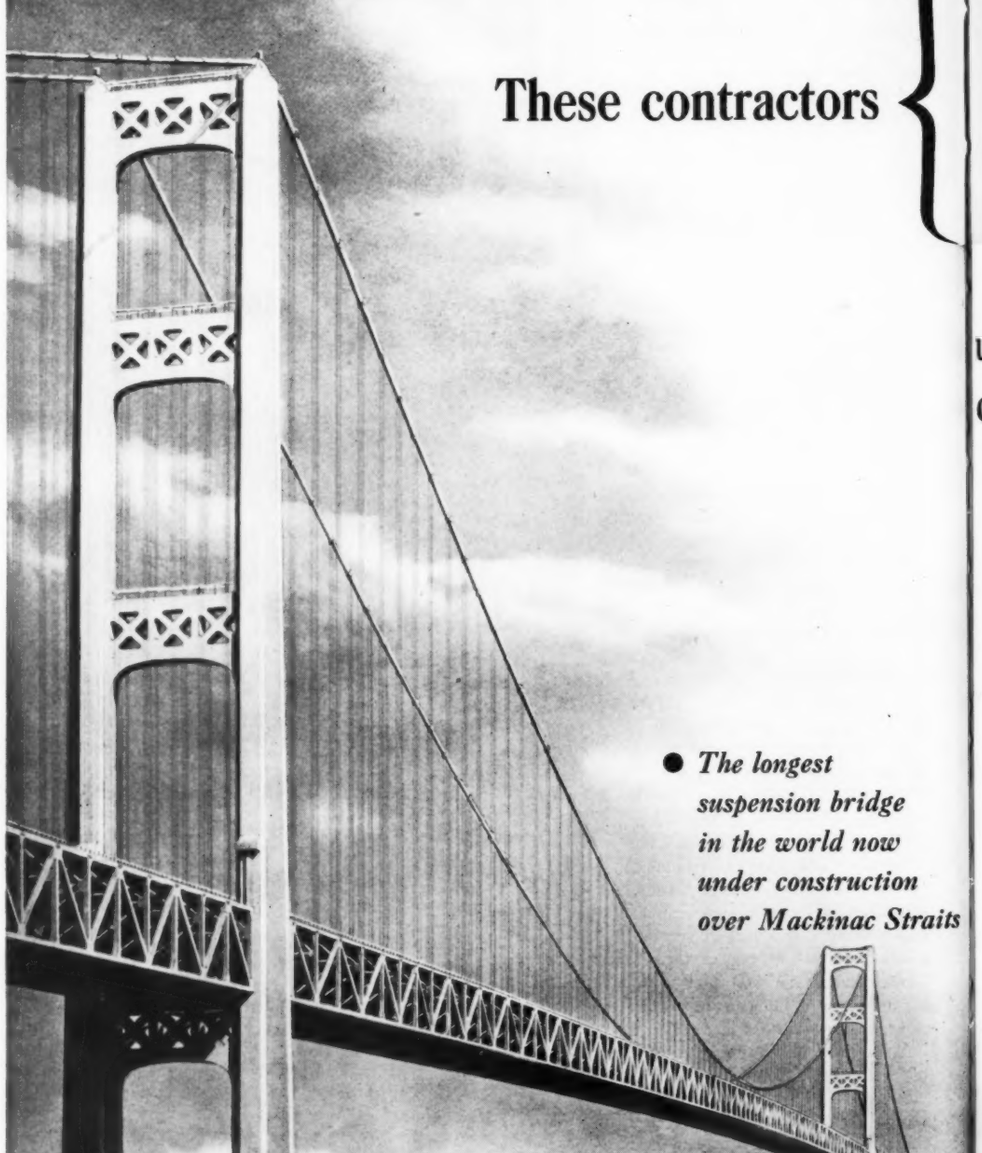
Earth barricades 14 feet high separate the magazines and surround the entire storage area. Also included in Etkin's contract were an administration building of concrete frame and block construction, a guard house, a well and pneumatic water supply system, and two miles of paved access road.

Steel wall forms

The walls of the cellular storage structures were formed with Economy steel form panels, furnished and erected by a subcontractor, Industrial Concrete, Inc., Pontiac, Mich. Prefabricated reinforcing steel cages were first set in place on the footings, and the wall forms were set up around them.

The forms were set in units for the complete 38-foot width and half of the 150-foot length of a structure. The 240 cubic yards of concrete required for this half-structure was then placed in a single operation by the general contractor's crews.

Since another contractor, Lewis & Frisinger of Ann Arbor, Mich., had a paving setup at the base, it proved


These contractors
● The longest suspension bridge in the world now under construction over Mackinac Straits
D. B. STEINMAN, CONSULTING ENGINEER

Making fast time, this Euclid S-12 brings earth for the 14-foot-high barricade that will rise in front of the line of structures already built. These protective barricades separate the magazines and surround the storage area.

The reinforcing steel set up, men erect Economy steel form panels for the walls of a cellular storage structure. Half a structure, covering the complete 38-foot width and half the 150-foot length, is formed and poured at a time.

convenient and economical to use this same equipment to produce the concrete for the structures. Lewis & Frisinger dry-batched the concrete from their plant in another area of the base, and trucked the batches to their Koehring 34-E Twinbatch paver, which was stationed beside the structure being poured. Water was supplied to the paver by one of the regular tank trucks used on paving operations.

Two cranes spotted

To place the concrete in the wall forms, Etkin stationed a crane on each side of the structure. On the same side as the paver was a Lima Model 604 crawler crane with a 60-foot boom. On the opposite side was a Lima Model 34 truck-crane with a 60-foot boom and a 15-foot jib. The lighter truck-crane, its outriggers in place, remained in one position for the entire operation; the crawler crane moved back and forth parallel to the building.

To get the concrete down to the bottom of the wall forms without segregation, the contractor used a series of tremies with square hopper tops. One of the cranes was kept busy a good part of the time moving these tremies from place to place so that the concrete could be placed over the entire area in relatively uniform lifts. This operation was usually done by the truck-crane.

The concrete was discharged from the mixer into Gar-Bro 1½-yard and Insley 1-yard buckets, which were picked up by a crawler crane and

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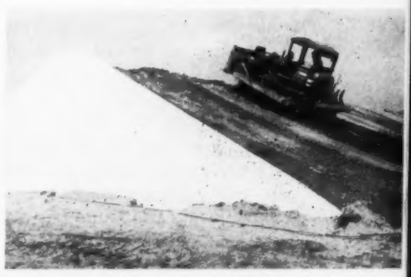

Dirt hauled by scrapers is shaped on a steep barricade by an Allis-Chalmers HD-5 tractor with Tracto ripper attachment and Baker dozer. The small tractors did a good job finishing the 2 to 1 slopes of the barricades. Seeding will finish the job when topsoil has been placed.

Merritt-Chapman & Scott Corporation and American Bridge Division of U. S. Steel Corporation

use Shell Lubricants in the construction equipment on Mackinac Bridge project

Today's engineering knowledge and modern construction equipment are making the mighty Mackinac Bridge a reality. This equipment requires oils and greases which will remain stable and give adequate lubrication at extreme temperature ranges. To keep their heavy-duty machines operating at maximum efficiency with a minimum of down time, both companies, Merritt-Chapman & Scott Corporation and American Bridge, chose Shell Lubricants and Fuels.

The Mackinac Bridge project is just one of the many construction operations where equipment was lubricated and protected by Shell products. Wherever *heavy-duty* equipment operates, Shell Lubricants and Fuels are being used to keep machinery in top operating condition and hold maintenance costs down. Perhaps it will pay you to investigate the savings that can be realized through the use of Shell Industrial Lubricants and Fuels.

American Bridge Division of U. S. Steel Corporation has strung a total of 12,500 tons of cable as part of the 66,500-ton superstructure.

One of the 34 piers of the bridge substructure built by Merritt-Chapman & Scott Corporation

SHELL OIL COMPANY SUPPLIES:

Gasoline	Solvents
Fuel Oil	Motor Oils
Diesel Fuel	Anti-Freeze
Kerosene	Greases
Industrial Lubricants	Outboard Motor Oil

and many other fuels and lubricants

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SHELL

For more facts, use Request Card at page 18 and circle No. 219

The truck-crane, its outriggers in place, swings a full bucket to the cell walls on its side. The crawler, which moves the 75-foot length of the pour, brings an empty to the Koehring 34-E Twinbatch paver for refilling.

(*Continued from preceding page*)

raised to the forms. This crane placed the concrete in the entire center wall and in the cell walls on the near side. Since the crawler crane could not reach far enough to place all the concrete, a system was devised for switching buckets from one crane to the other.

An 8×10-foot transfer platform was installed at the level of the top of the cell walls. The well-braced legs of this platform reached down to the concrete slab floor of the building, and the deck was built strong enough to support the loaded concrete buckets.

The crawler crane set a loaded bucket on this platform, and the truck-crane picked it off and swung it to the wall forms on the opposite side of the structure. Meanwhile, the first crane was returning an empty bucket to the mixer for another load of concrete. There was rarely more than a momentary wait as the cranes traded buckets on the platform. When the pour for half a building was complete, one of the cranes picked up the transfer platform and set it in place for the next concrete placement.

As the concrete was placed in the forms it was vibrated by two Maginniss Hi-Lectric vibrators operated from a single Maginniss generator.

The scaffolds used by the men during placing operations were prefabricated in sections from 2×10 planks. The sections were supported on the wall forms and were set in place and removed by one of the cranes. These panels were stored and moved on wagons.

Earth barricades

Separating all of the structures in the group, and surrounding the entire area, is a series of earth barricades. These piles of earth are 14 feet high along their centerline and have 2 to 1 side slopes on both sides. They terminate in concrete retaining walls built to match the shape of the cross section of the barricades. These piles of sandy material were covered with topsoil and seeded.

The general contractor built the concrete retaining walls with his own forces and sublet the earthwork to O. J. Hoag, Detroit. Hoag opened a borrow pit on the base about three-quarters of a mile from the storage area and moved the 60,000 cubic yards of material with three Euclid S-12 scrapers.

In the pit, the scrapers were assisted on the loading cycle by an International TD-24 tractor. A Caterpillar D8 tractor-dozer helped shape and compact the fills, and an Adams motor grader built and maintained the haul roads.

Since the barricades had to be finished to within 1/10 foot, the dressing of the steep 2 to 1 slopes presented a problem. This challenge was met to everyone's satisfaction by Allis-Chalmers HD-5 and HD-6 tractor-dozers that worked efficiently up and down the steep slopes and produced satisfactory results.

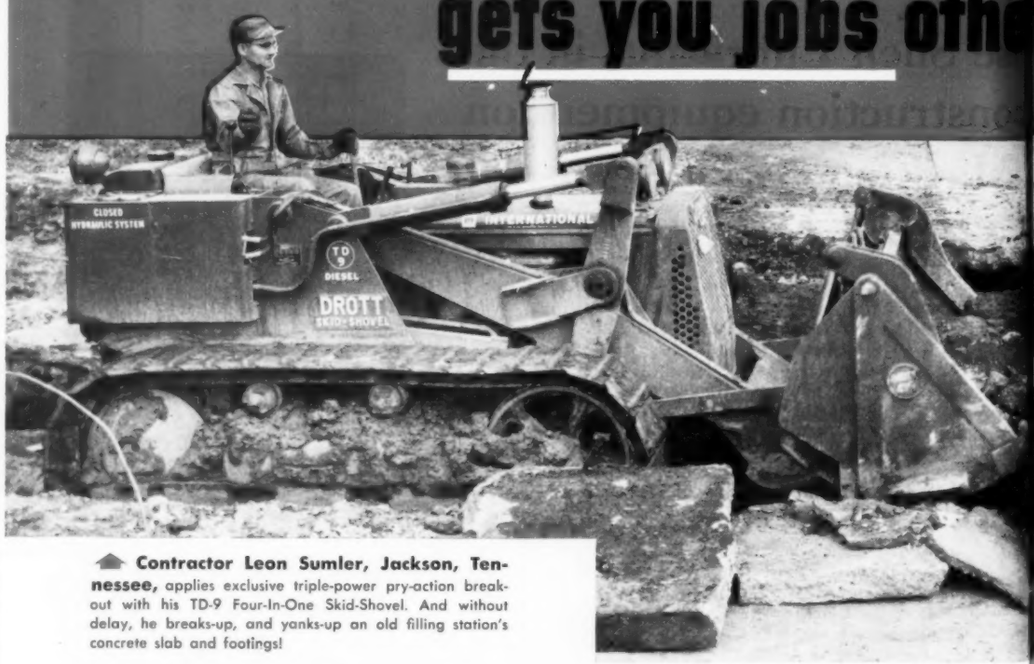
Five of these small tractor-dozers, brought in by Tawas Sand and Gravel Co., Tawas, Mich., finished the grade of all of the barricades under a subcontract with Hoag. Tawas Sand & Gravel then subbed the topsoil and seeding directly from Etkin and used the same machines to place the topsoil.

The 2-mile access road to the ammunition storage facilities was paved

How concrete-smashing

PRY-ACTION BREAK-O

gets you jobs other



Contractor Leon Sumler, Jackson, Tennessee, applies exclusive triple-power pry-action break-out with his TD-9 Four-In-One Skid-Shovel. And without delay, he breaks-up, and yanks-up an old filling station's concrete slab and footings!

This new 3-yd. TD-18 Four-In-One Skid-Shovel proved able to do as much as 3 power shovels and a dragline—excavating and loading up to 1,700 lineal feet of old concrete pavement daily—operating for Henry E. Berghuis, Prinsberg, Minn.

Street-widening and regrading calls for removing old concrete pavement—which the new TD-9 Skid-Shovel is loading out at 600 cu yds per day! Dennis Widmer, Portland, Oregon, own this outfit with the job-getting break-out power!

with a 9-6-9-inch concrete slab 18 feet wide. The road was graded by Hoag and paved by Lewis & Frisinger under subcontracts.

To insure maximum production and efficiency on the job, which had a rapid construction schedule of 180 calendar days and liquidated damages of $1,500 per day, Alex J. Etkin and Robert E. Johnson of the contractor's Detroit office made weekly flights to the job site. On occasion, when conditions indicated that immediate action was necessary, parts and materials were even flown to the job site.

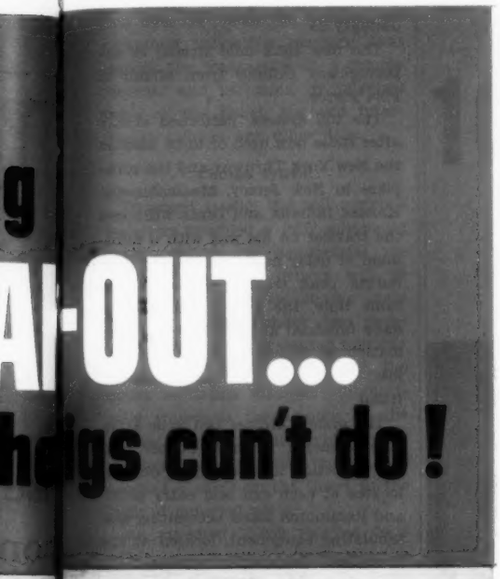
Throughout the job, the Corps' Construction Division, headed by Elmer A. N. Sorensen, gave the contractor invaluable aid in completing the contract on schedule, even going so far as to get clearance from the base commander for the contractor's plane to land at the base and taxi to the site instead of landing at the civilian airport at Alpena, Mich.

Personnel

Field superintendent J. H. "Joe" Warren supervised the work for A. J. Etkin Construction Co., with J. D. "Jake" Dow taking charge of the field office. Chester Cheeseman was superintendent for O. J. Hoag on the earthwork. Tawas Sand & Gravel Co. operations were under the direction of John Kenosky.

The contracting officer was Col. Peter C. Hyzer, district engineer, Detroit District, U. S. Army Corps of Engineers. Representing the district at the site was D. J. Keliher, resident engineer. The completed facility was turned over to the U. S. Air Force, Wurtsmith Air Force Base, which has Col. T. N. Wilson, USAF, as base commander. THE END

J. H. "Joe" Warren, field superintendent for A. J. Etkins Construction Co., Oak Park, Mich., checks on a concrete-placing operation. ►



Thirty-six times as fast as 3 men and a jack-hammer ld do it—this TD-14 *broke-up, dug-out, and loaded* 180 lineat of old one-by-four-foot concrete wall, in only 4 hours! Owner: derson Trucking and Excavating, Inc. Buffalo, N. Y.

Pry-action break-out force ranges from 12,000 lbs. on the International Drott TD-6 Four-In-One Skid-Shovel—to 27,000 lbs. on the TD-18 model. For special applications like land-clearing, the TD-18 model can be equipped with larger hydraulic cylinders to develop 54,000 lbs. of break-out!

Patented and exclusive International Drott pry-over-shoe break-out action gives you *up to six times as much excavating power* as ordinary front-end loaders can deliver! Only an International Drott gives you this multiplied force of the scientific lever principle acting over big skid-shoes, and teamed with ground-level bucket roll-back. *No other loader even has skid-shoes!*

Only International Drott-developed reverse cylinder action produces the tremendous hydraulic power for pry-action break-out. And this pry-action principle shunts shock-stresses directly into the ground—so they can't maul loader or tractor.

Measure the job-getting, capacity-adding advantages of exclusive triple-power, pry-action break-out. Note how exclusive parallelogram raise action keeps the bucket level, all the way up—reduces spillage—increases your daily yardage up to 18%! Prove that exclusive, shock-swallowing Hydro-Spring protects equipment, adds operator comfort. And try the exclusive International Drott Four-In-One that *gives you four-machine utility* for one moderate investment—in your choice of four sizes, one-yard to three-yard capacity. See your International Drott Construction Equipment Distributor for a demonstration.

A tough oak tree with 22-inch trunk is uprooted with the tremendous pry-action break-out—applied by TD-14 using grubber blade attachment, instead of bucket. Owner Lester H. Davis, Bennington, Vermont, is clearing farm land.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

Gen. Davis to command Pacific Ocean District

The U. S. Army Corps of Engineers has organized a new division, the Pacific Ocean Division, with headquarters in Honolulu, Hawaii. The new division, headed by Brig. Gen. Ellsworth I. Davis, will be responsible for contract construction in Korea, Japan, Taiwan, Okinawa, and the Territory of Hawaii. Gen. Davis was formerly chief of staff and then deputy commanding general of The Engineer Center, Fort Belvoir, Va.

Previously, military construction in Korea, Japan, Taiwan, and Okinawa has been the responsibility of the commanding general, U. S. Army Forces, Far East with headquarters in Japan. Construction in Hawaii has been under the South Pacific Division engineer in San Francisco, Calif. Now, the Ryukyu Islands, which includes Okinawa, is the Okinawa District under the supervision of district engineer Col. George E. Finley.

The existing U. S. Army Construction Agency in Korea and the U. S. Army Construction field office in Japan will form the Far East district with headquarters in Seoul, and a branch office in Japan. Col. Stephen E. Smith is the Far East district engineer. The Honolulu office has been transferred to the Pacific Ocean Division, where Lt. Col. McGlachlin Hatch is district engineer.

Urban road planning topic of HRB bulletin

Three papers on urban arterial planning are contained in Bulletin 153 of the Highway Research Board. The first uses the Detroit metropolitan area traffic study as a basis for describing trip desire chart construction and applications.

The second uses the Dallas County, Texas, origin-destination survey of 1950–1951 to project travel data to 1980 and depict it graphically. Contour and block directional maps and their applications are described. The third paper describes comprehensive arterial highway plan for the Cleveland metropolitan area.

Priced at 90 cents, the bulletin may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

←For more facts, circle No. 220

Management

Daily receipts checked by collection, recording devices at interchanges; also by accounting and tabulating equipment at the turnpike authority's offices

Toll system safeguards against loss of revenue

The Florida State Turnpike Authority has awarded contracts amounting to more than $325,000 to the Remington Rand Division of Sperry Rand Corp., producers of accounting and tabulating equipment, and Taller and Copper, Inc., manufacturers of toll collection machinery, for an integrated toll collection and auditing system on the first section of the Sunshine State Parkway, opened last January 25.

The new 108.8-mile stretch of superhighway extends from Miami to Fort Pierce.

The toll system, patterned closely after those now used or to be used on the New York Thruway and the turnpikes in New Jersey, Massachusetts, Kansas, Indiana, and Texas, will speed the traveler on his way with a minimum of delay at the toll booth, even during peak travel periods. At the same time, the system will provide daily financial and traffic flow information, as well as safeguards against loss of revenue by inaccuracy or fraud.

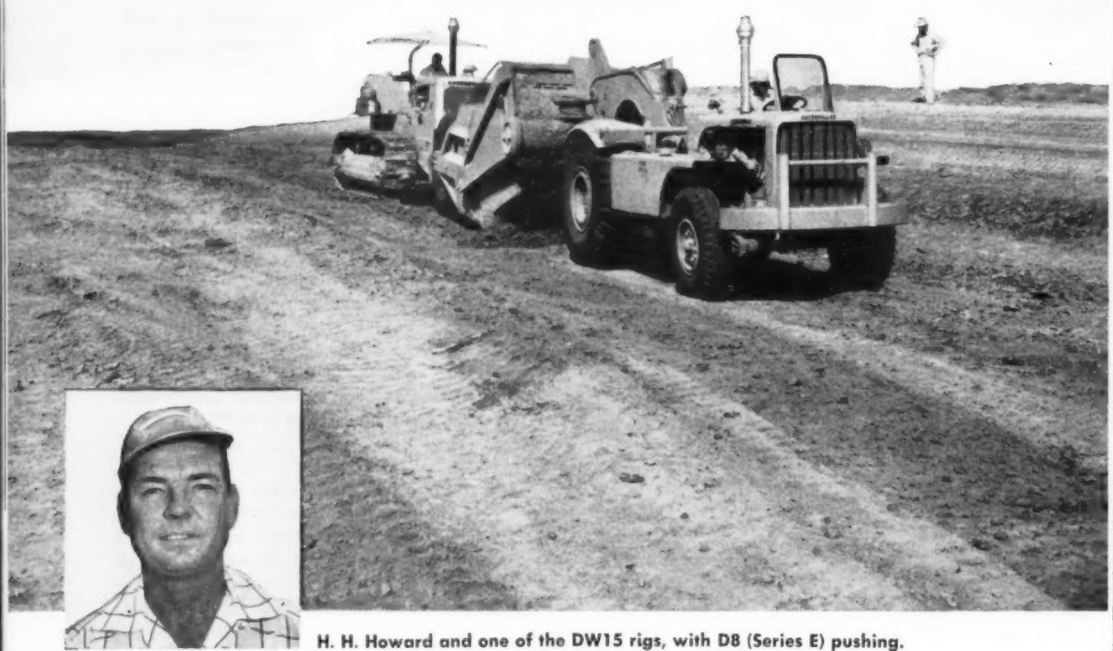
The system utilizes two basic types of equipment: Taller & Cooper field toll collection and recording devices, located at each exit and entry point, and Remington Rand accounting and tabulating equipment, located at the Turnpike Authority's offices. Although situated separately and differing in physical appearance, both systems are designed for a single purpose: to control all toll collection and accounting functions of the parkway.

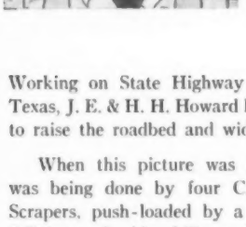
Operation

Operation of the system begins with the approach of the car at any one of ten exit-entrance interchanges that provide direct connection with other major highways along the 108.8-mile route. A driver entering the Parkway stops at the toll gate just long enough to receive a Remington Rand punched-card toll ticket. As the vehicle approaches, the attendant classifies the vehicle according to one of six classes (truck, passenger car, bus, etc.,) and depresses the corresponding key on a ticket-issuing machine. The toll ticket contains punched holes indicating the interchange number and type of vehicle, plus printed information showing those two items plus a serial number, the time of issuance, and the attendant's identification number. Printed on the card are fares to every other interchange along the route for each type of vehicle.

At this point, much of the automatic equipment takes over to virtually eliminate the human element. As the toll ticket is issued, a complete recording of the transaction is automatically sent to a remote recording device that is totally inaccessible to the collector. As the vehicle leaves the toll lane, its wheels run over a

Four DW15s move 350 yards of hard clay per hour on half-mile haul





H. H. Howard and one of the DW15 rigs, with D8 (Series E) pushing.

Working on State Highway 26, south of Daingerfield, Texas, J. E. & H. H. Howard have a 735,000-yard contract to raise the roadbed and widen part of it to four lanes.

When this picture was taken, all the earthmoving was being done by four CAT* DW15 Tractors with Scrapers, push-loaded by a D8. The spread averaged 3,500 cu. yd. of hard Texas clay per 10-hour day, hauling half a mile.

H. H. Howard says: "Our DW15s have worked steady for a year and a half with no trouble whatsoever except to replace an occasional cable. With the new D8 to push, we can load in a few seconds and keep all four scraper units on the run. Now we're buying a fifth DW15." This unit, incidentally, will make the twenty-fifth DW15 in the Howard fleet.

Now Caterpillar offers a *new* DW15 (Series E) with a new No. 428 LOWBOWL Scraper. The Cat high-torque Engine, specifically designed for the DW15, delivers 200 HP (maximum output capacity). With speeds up to 37.2 MPH, plus the extra sure-footedness of four-wheel traction, this rig gives you faster hauls and cycle times with greater safety. The No. 428 Scraper has a capacity of 13 cu. yd. struck—18 cu. yd. heaped—and it loads quicker and more easily because of LOWBOWL design.

Let your Caterpillar Dealer give you an on-the-job demonstration of this unit. Remember, he stands behind every machine he sells with prompt, reliable service and Caterpillar parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK

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treadle that records each passing axle by means of a pulse to the remote recorder. The treadle responds only to the rolling motion of wheels and distinguishes between forward and backward motion. This prevents incorrect counts if other objects should strike the treadle or if cars back up.

When the parkway user surrenders his toll ticket at an exit, the collector determines at a glance the amount of fare due. He places the ticket in an automatic validating machine that records the transaction in a remote recorder and indicates, by punched holes on the ticket, the exit interchange number and other data.

Charge system

To speed traffic, the toll system's designers provided a fully automatic charge system for commercial vehicles. Commercial drivers will be given a small plastic charge plate like that for department store shoppers. When this is presented together with the toll tickets at the exit, the ticket validating machine automatically transmits the amount of the charge to the remote recorder for subsequent billing and records the account number on the ticket in the form of punched holes.

An expected 15,000 vehicles daily will be accounted for by Remington Rand accounting and tabulating equipment during the first year of operation. Each day, the Turnpike Authority office at Fort Lauderdale will receive the punched-card toll tickets, remote recorder tapes, and summary reports from each of the parkway's interchanges.

Daily summary

Within 24 hours, the Authority will have detailed printed reports showing, for example, the amount of cash that should have been received by each toll collector, and the total revenue for each type of vehicle. They will receive important traffic-flow analyses, indicating total traffic for the parkway as a whole, and for each section. The basic toll tickets will be used with automatic billing equipment to prepare statements for charge-account users.

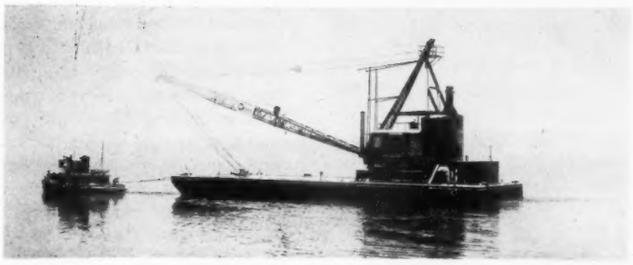
This high-speed and thorough data-reporting system will enable the Turnpike Authority to spot cash and traffic variance quickly, and to learn almost immediately of the growth of chronic traffic bottlenecks. The up-to-the-minute reports will tell road maintenance engineers what sections are most heavily traveled and require the most attention. The data will provide realistic guides for the best dispersal of law enforcement officers. And, over a period of time, state highway planners may find the daily traffic reports excellent indicators of where expanded facilities are most needed. THE END

Heavy-duty crane barge set for big projects

Ready to handle all types of marine construction and dredging, including jobs too large for conventional equipment is the newest addition to the fleet of the Perini Corp.'s Marine Division—a specially constructed crane-barge.

Launched at Port Deposit, Md., yard of Wiley Mfg. Co., the Whirley CB-501 measures 120 feet in length, 50 feet in width, and 8 feet in depth, and is of all-welded steel construction. The bow is raked and the stern is square.

The hull is divided into 14 watertight and 2 oil-tight compartments. Of these, 2 are fuel oil tanks, each with a capacity of 6,800 gallons, and two are 22,000-gallon-capacity water tanks.



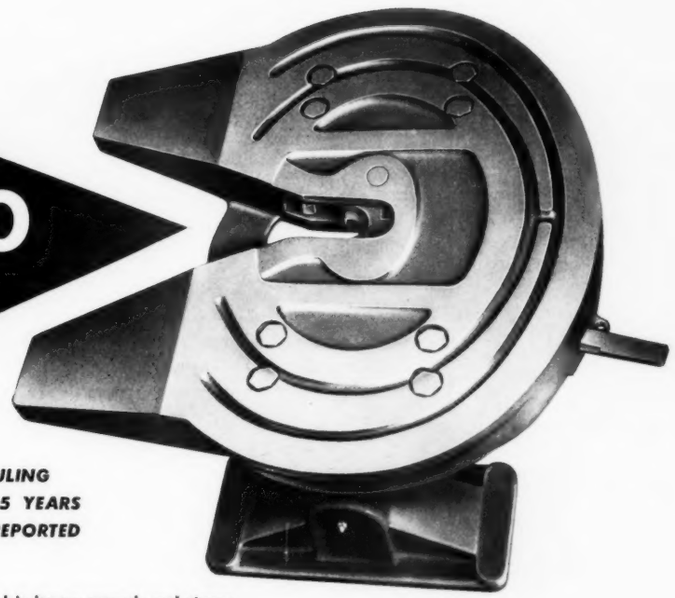
The Perini Corp.'s first Wiley Whirley leaves the manufacturer's yard at Port Deposit, Md., on its way for delivery to the firm's Marine Division in Boston.

The straight-type boom, measures 100 feet from hinge pins to boom point. Load block capacities are: main, 50 tons; auxiliary, 20 tons; whip, 10 tons. The tail swing is 21 feet. The diameter of the rail and roller circle is 24 feet.

The hoist line pull is 25,000 pounds at 200 fpm on the second layer of cable. The swing mechanism has an independent steam engine with a 9-inch bore and a 10-inch stroke.

100% GUARANTEED TO HANDLE YOUR HEAVIEST LOADS

HOLLAND FW-100 FIFTH WHEEL



SERVING THE HEAVY HAULING INDUSTRY MORE THAN 15 YEARS AND NEVER A FAILURE REPORTED UNDER ANY LOADS

The Holland FW-100 Fifth Wheel is heavy enough and strong enough to handle any load — 50 tons, 100 tons, and up — in off-highway or over-highway service. If your tractors can pull it, the FW-100 can hold it. You can use the FW-100 for routine trucking operations, too, because it's designed for a standard king pin. It couples with just an easy nudge, thanks to the exclusive Holland mechanical spring lock. No battering or ramming that can pound your equipment to pieces. Full contact on both the neck and shoulder of the King pin provides 360° locking area for top security.

If you want to end your fifth wheel troubles and do away with replacement costs once and for all, write for complete information on the FW-100.

T-390 PINTLE HOOK
Rubber Mounted Heavy Duty Type, with Clevis Pin Head

Ask for bulletins on heavy-duty jack supports, pintle hooks, and other equipment engineered expressly for your heaviest service.

HOLLAND HITCH COMPANY
HOLLAND, MICHIGAN

For more facts, use Request Card at page 18 and circle No. 222

names in the news

John M. Kyle, awarded the Distinguished Service Medal for directing the design and construction of the Lincoln Tunnel Third Tube.

Distinguished Service Medal awarded to Kyle

John M. Kyle, chief engineer of the Port of New York Authority, was awarded the bi-state agency's Distinguished Service Medal for directing the design and construction of the $100 million Lincoln Tunnel Third Tube. The award, given at the dedication ceremonies of the Third Tube, cited Kyle for his engineering skill, energy, and the limitless time he has given to the job; and for the burden of responsibility he has carried throughout the work.

Kyle has worked on the $120 million "Terminal City" development at New York International Airport, the $85 million Brooklyn-Port Authority Pier development of two miles of premier Brooklyn waterfront, and the West 30th Street heliport.

A licensed professional engineer in New York and New Jersey, Kyle is a member of the American Society of Civil Engineers, the New York Chapter of the New York State Society of Professional Engineers, and a trustee of The Moles.

Military engineer group honors Eads

Col. Edwin M. Eads, Air Force installations representative of the South Pacific Region, has been awarded the Newman Medal for 1956 by the Society of American Military Engineers. Col. Eads was given the medal for his outstanding achievement during the year in design, construction, administration, research, and development of military engineering.

In supervising all air force design and construction in California, Arizona, Utah, and Nevada, Col. Eads has made sure that all Air Force operational requirements embody the best in design and construction. The award further stated that his personal initiative, and executive and technical ability have been prime factors in eliminating delays which would jeopardize the development of air bases, missile sites, and radar stations that form the West Coast defense.

Col. Edwin M. Eads, winner of the 1956 Newman Medal of the Society of American Military Engineers.

Col. Eads is first vice president of the San Francisco Post of the Society of American Military Engineers, and is a member of the American Society of Civil Engineers.

M-C&S appoints project manager for Arizona dam

Herbert S. Booth has been named project manager for the Glen Canyon Dam in northern Arizona for Merritt-Chapman & Scott Corp., New York, N. Y., contractors. The firm also appointed Richard G. Park field purchasing agent for the same project.

Booth, who has been in the construction field for more than 30 years, most recently headed up M-C&S' dredging project on the St. Lawrence River channel. He was also a project manager on McNary Dam in Oregon, and Agno Dam in the Philippines.

Park formerly held a similar post at Priest Rapids Dam, the $92 million hydroelectric power project currently being built by M-C&S on the Columbia River for the Public Utility District of Grant County, Wash.

Pa. highway news

Knut H. Jensen has been appointed chief bridge engineer of the Pennsylvania Department of Highways. Considered one of the outstanding specialists in his field, Jensen was formerly bridge engineer in charge of design and construction for the Pennsylvania Turnpike Commission.

The department also appointed Raymond F. Campbell executive officer to work with the secretary of the department and serve as his representative in administration.

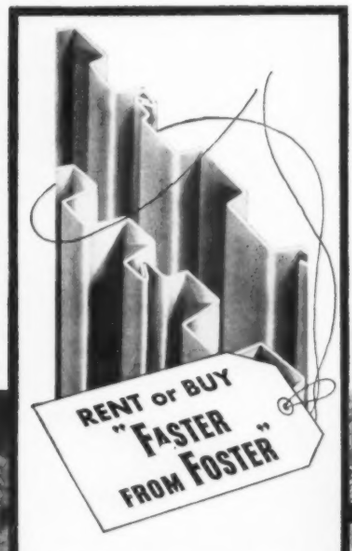
Campbell is succeeded in his former post of district engineer at Hollidaysburg by Victor B. Leopold, who has also been assigned to the program-planning division in the central office.

New assistant publicity director for the department is John L. Shepherd, formerly a city hall reporter for a York, Pa., newspaper.

Harry W. Montz has been named chief mining engineer for the northeast extension of the Pennsylvania Turnpike Commission. Montz was employed by the Lehigh Valley Coal Co. for 40 years, and after his retirement was a consultant for J. G. White Engineer Corp., New York City.

FOSTER LIGHTWEIGHT PILING

the best, low-cost protection for light load excavation



We'll deliver to your job site with the fastest service available . . . any lengths you require, from Foster warehouse stocks. Buy your basic needs for your regular jobs and fill in for special installations by using our low cost Rental Plan.

So many features of the new Foster Lightweight Piling appeal to the contractor looking for efficient job techniques. This is the most economical sheeting available for lighter jobs . . . offers greater strength pound for pound than any other lightweight steel piling.

There's no need for special rigs. Easier driving and easier recovery, less bracing, minimum damage to paving around the job when piling is pulled . . . all these advantages make for all-around lower job costs. And Foster Lightweight Piling is easy to handle! New design Interlock cannot jam, locks rigidly when installed, yet comes apart easily. Learn all about this modern answer to economical shore and pier protection, sump pits, trenches, abutments, bulkheads, cofferdams. Write for catalogs or quotations on your next job.

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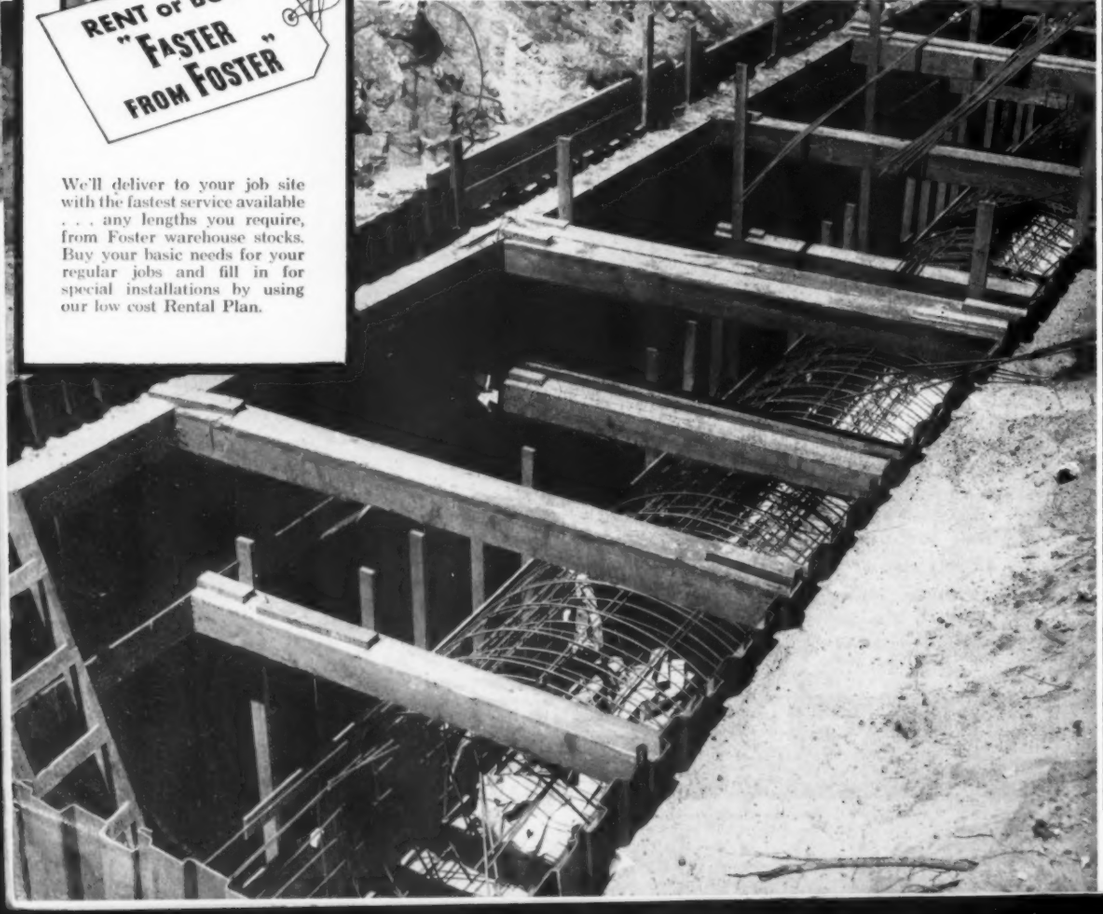


←For more facts, circle No. 223

Paul D. Smith, newly elected president of Intrusion-Prepakt, Inc.

P. D. Smith new president of Intrusion-Prepakt, Inc.

The board of directors of Intrusion-Prepakt, Inc., Cleveland, Ohio, has elected Paul D. Smith president, to succeed retiring company founder Louis S. Wertz. A director of the firm since 1939, Smith has been vice president and executive vice president. He is also a director and officer of Intrusion-Prepakt, Ltd., Toronto, Canada.

Smith is a member of the American Institute of Accountants, Illinois Society of Certified Public Accountants, and the Ohio Society of Certified Public Accountants.

ASCE section elects head; names engineer of the year

Roger H. Gilman, director of Port Development of the Port of New York Authority, has been elected president of the Metropolitan Section of the American Society of Civil Engineers. The section—covering Greater New York, Long Island, Westchester, and Rockland counties, and northern New Jersey—also elected Michael N. Salgo, vice president; William J. Shea, treasurer; and William H. Correale, Gardner M. Reynolds, and John P. Zehner, directors.

The Metropolitan Section named Howard L. King, consultant on the third tube of the Lincoln Tunnel, Metropolitan civil engineer of the year. King was designated outstanding in the field of tunnel construction for having done "a work of wide public interest."

King was awarded The Moles' award for 1956 for distinguished service, notably as engineer in charge of the sub-aqueous and rock tunnel construction over the past 20 years.

Asphalt Institute fills district engineer posts

Maj. Ralph C. Bunnell has been assigned to the post of district engineer at Albany, N. Y., by the Asphalt Institute, College Park, Md. Bunnell was engineering officer in charge of construction of helicopter facilities for the U. S. Army Corps of Engineers. He directed the construction of military air bases in Korea and at five West Indian islands.

Aubrey M. Tinder, Jr., asphalt paving engineer with the Virginia Department of Highways, was named to the post of district engineer at Atlanta for the Institute. Tinder fills the vacancy created by the transfer of district engineer Frank H. Gardner to College Park headquarters. Tinder holds an associate membership in the American Society of Civil Engineers and is a member of the Society of American Military Engineers.

Kaiser Construction names new resident manager

Heavy industrial construction expert, Dwight A. Dougherty, has been appointed resident manager of the Henry J. Kaiser Construction Co., Oakland, Calif. Dougherty will be responsible for all construction and related activities at the new Kaiser Aluminum & Chemical Corp. reduction plant and rolling mill, a $200 million project that is currently under construction at Ravenswood, W. Va.

Since 1953, Dougherty has been assistant director of construction for a major eastern construction company, and before this was one of their resident managers of construction for 16 years. He was manager of the main process piping and equipment erection portions of the billion dollar Atomic Energy Commission gaseous diffusion facility at Paducah, Ky.

AGC names Dooly manager of public relations

William G. Dooly, Jr., has been promoted to manager of public relations and publications for the Associated General Contractors of America. Dooly will also be editor of the society's official magazine, *The Constructor*, succeeding W. E. Woodruff, who died recently after a car crash.

At the same time, James D. Marshall has been appointed publisher and William E. Dunn is associate publisher. Frank J. Rooney was elected president of the board of directors.

Public Works Department of N. Y. names Wright

James F. Wright has been appointed assistant superintendent for administration and fiscal management in the New York State Department of Public Works. In this position, Wright will be responsible for planning and directing department activities in finance, including budgetary planning and control; personnel management; and land acquisition. He will also plan and direct administrative management within the department. This includes organization planning, procedural analysis and development, and establishment of management controls.

Wright was formerly in the Defense Department office.

Firestone Rock Grips lead all tire choices with tread designs that travel any terrain!

Firestone Tubeless Rock Grips are making big news wherever heavy equipment rolls. Two great tread designs match toughness with traction to move your heavyweights over any course. Rock Grip construction eliminates your need to change tires to match terrain. It delivers the full flotation you need for sand and soft stuff. It also has the armored grip necessary to negotiate rock-hard runs over broken shale. Safety-Tensioned *Gum-Dipped*® nylon bodies and cut-resistant treads make these Firestones first choice tires with men who move equipment. Your Firestone Sales Engineer can demonstrate why you'll make them your first choice, too. Contact him today—through your local Firestone Dealer or Store.

ROCK GRIP WIDE BASE ROCK GRIP

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1957, The Firestone Tire & Rubber Company

For more facts, use Request Card at page 18 and circle No. 224

Picking up material from the channel area, this Caterpillar DW20 scraper, push-loaded by a Cat D8, gets ready to head for the levee fill. By placing material directly in the levees, the contractor was able to get double pay—justification for the longer hauls.

Big machines take ove hen

Rubber-tire scrapers and big draglines team up to move ten million cubic yards of earth for floodway project

With unit prices for earthwork ranging from 8.25 cents per cubic yard for channel excavation to 17.25 cents per yard for levee embankment, a contractor has to move a lot of dirt in a short time to make the job pay.

Realizing that work has to be done quickly and economically with bid prices as low as these, Pioneer Contracting Co., Inc., Memphis, Tenn., is working with a spread of machinery that will complete the $1.57 million contract covering part of the Yazoo River Lower Auxiliary Channel just north of Vicksburg, Miss., late this summer—more than five months ahead of the February, 1958 completion date.

A careful study showed that big draglines could build the entire cross section of the levee, except a small portion of the outer toe, from the borrow pits without having to recast the material. The dirt that scrapers and hauling units put into the levees would then be placed in this outer toe section, saving the cost of a second casting by the draglines.

Following this plan through, Pioneer Contracting equipped the job with two big Page walking draglines, several spreads of rubber-tire scrapers and small draglines.

Wasting no time in getting the big items under way after the March, 1956 starting date, the firm actually earned about 80 per cent of the total contract amount during the ten months of work last year.

Part of big project

Pioneer's job, while big in itself, is actually a small part of a much larger project. The Yazoo River Lower Auxiliary Channel is part of the large Yazoo Basin Headquarters project, which is being planned and constructed under the supervision of the Vicksburg District of the U. S. Army Corps of Engineers. The entire project includes four reservoirs in the upper reaches of the river, many miles of levees in the lower valley, and the improvement of the main stream and tributary channels, as well as construction of the lower auxiliary channel.

As its name implies, the Auxiliary Channel is a second channel or floodway for the river. It is designed to carry flood flows past Yazoo City and Satartia, emptying back into the normal channel at its junction with

About 3 million cubic yards of dirt will be moved in construction of Table Rock Dam southwest of Springfield, Missouri. Power pool will cover 43,100 acres. Project is joint venture of Morrison-Knudsen and Utah Construction. Estimated completion date: 1958.

Report from Table Rock Dam

Morrison-Knudsen Co., Inc., and Utah Construction use one grease for all purposes

AMOCO* Lithium Multi-Purpose Grease helps contractors meet manufacturer's recommendations for lubrication yet reduces grease inventories.

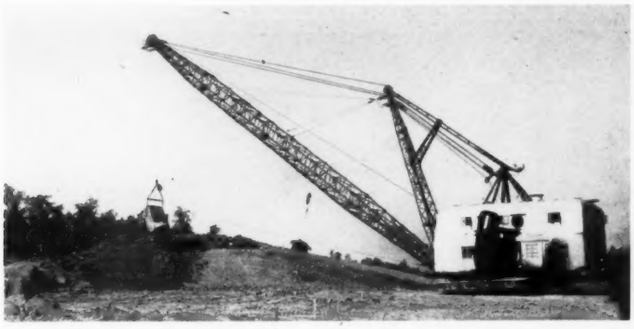
On the Table Rock Dam project the problem was how to lubricate more than 16 different *types* of equipment and still follow equipment manufacturer's recommendations without carrying a big inventory of greases. The answer to the problem was found in Amoco Lithium Multi-Purpose Grease. Here's the case history:

Morrison-Knudsen and Utah Construction lubrication and maintenance men, working with Standard Oil automotive lubrication specialists, made a complete lubrication survey. They studied each piece of equipment, the points to be lubricated and the manufacturer's lubrication recommendations. Amoco Lithium Multi-Purpose Grease proved to be the ideal lubricant for the job in every instance where it was recommended and used.

Bucket on the way! Harold Maxwell, Superintendent of Morrison-Knudsen Company, and Bob Buel watch eight-yard bucket of concrete pass overhead on way to forms. Standard management realizes importance of lubrication on construction projects, backs up lube sales with top-rated technical service.

ove hen bid price is low

One of the Page 621S draglines on the job has a 150-foot boom. As it casts borrow-pit material with the Hendrix 7-yard bucket, a Cat D6 shapes the levee.



the Big Sunflower River. The new 32-mile channel is substantially straight, cutting many miles off the route taken by the natural winding channel of the river.

Starting at the Sunflower River, the downstream half of the auxiliary channel consists of a central pilot channel averaging 23 feet deep with a 50-foot wide bottom and 2 to 1 side slopes. This channel lies in the middle of a 3,000-foot-wide floodway bounded by levees that average 16 feet in height. Further upstream, where the grade is steeper, the channel widens to 150 feet at the bottom, but the floodway narrows to 1,000 feet between the levees. In the upper reaches, the levees will average only 9 feet in height.

Ten million yards of earthwork

Pioneer Contracting is not the prime contractor on the project, having subcontracted the entire job from the combine of Linwood Smith, Lake Village, Ark., and Kenyon Dredging Co., Port Allen, La., the successful bidders. Pioneer was the second low bidder. This first contract covers the construction of the lower 7.0 miles of the channel and levees, together with drainage facilities and incidental work. It includes 3.07 million cubic yards of channel excavation, bid at a price of 8.25 cents per cubic yard; 1.196 million cubic yards of ditch excavation, bid at 9 cents per cubic yard, and 6.02 million cubic yards of levee embankment bid at 17.25 cents per cubic yard.

Working with Hendrix 7-cubic-yard buckets, the two big Page walking draglines made fast time excavating the material, aided by the rubber tire scrapers and small draglines.

Heavy clearing work

Before this equipment was able to start earthwork production on an upward spiral, clearing and grubbing was done in the dense hardwood forest that slashed across a portion of the channel. Clifford Mehler, Yazoo City, subcontracted the clearing and grubbing of 1,400 acres of land on which the channel, drainage ditches, and levees were to be constructed.

Using a spread of tractors equipped with dozers and special clearing equipment, Mehler moved into an area and knocked down all of the trees. Two very effective rigs on this work were Caterpillar D8 tractors equipped with Crossville clearing blades and pushover bars. The big V-shaped blades had sharp saw-like horizontal projections at the bottom which enabled them to cut relatively large trees at or below the ground level. The pushover bar extended out in front of the blade and was used to knock down trees after they had been cut part way through.

These rigs and the other tractor-dozers of this spread were fitted with heavy guards to protect the operators from falling timber or flailing branches.

When the trees had been knocked down, a commercial timber operator

(*Continued on page 42*)

AMOCO Lithium Multi-Purpose Grease was adopted for all equipment. Morrison-Knudsen and Utah Construction have realized substantial savings. A smaller grease inventory reduced investment in supplies and cut record keeping. Dispensing and handling equipment now used is much less than what was formerly required. Application time is reduced to a minimum. Misapplication errors and resultant bearing failures are virtually eliminated.

Your lubrication problems can be licked in just the same way Morrison-Knudsen and Utah Construction have done it at Table Rock Dam. No matter where your job may be, in any of the 15 Midwest and Rocky Mountain states, there is a Standard Oil automotive lubrication specialist nearby. Call him. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Standard's Bob Buel (left) checks lubrication data with Jerald Maxwell, lube foreman with Morrison-Knudsen. Bob is qualified to assist customers with lubrication problems. He has been doing this work for more than four years. He's a graduate of Missouri School of Mines with a B.S. degree and has completed the Standard Oil Sales Engineering School. Customers find Bob's experience on the job and special training pay off for them.

Quick facts about

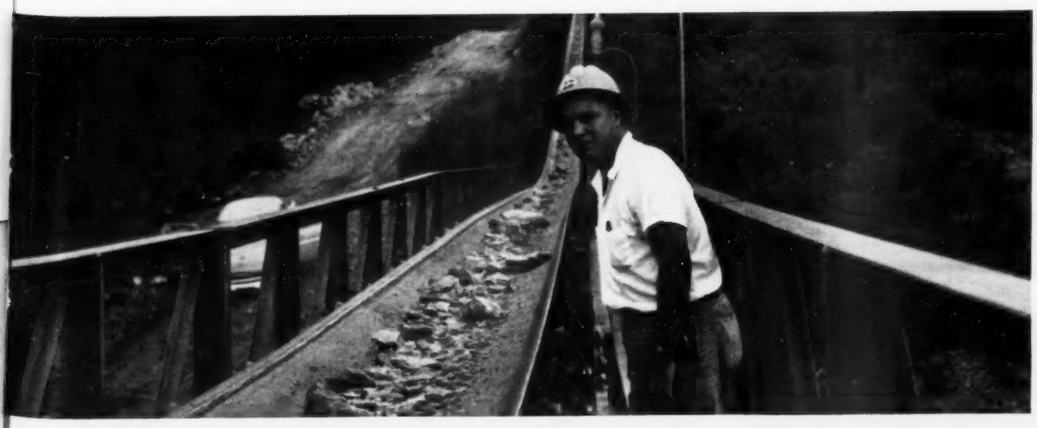
AMOCO* Lithium Multi-Purpose Grease

- Suitable for chassis, wheel bearing, water pump, universal joint, gear case, track roller and other grease lubrication.
- Pumpable at all temperatures. Easy to apply.
- Lubricates effectively in all weather. Soft grade available for extremely low temperature service.
- No bearing wash out even in severe service.
- Does not oxidize or cake in bearings.
- Mechanically stable. Will not thin in use.
- Stable in storage. Maintains uniform consistency.

*Trade mark AMOCO registered U. S. Patent Office by The American Oil Company and used by Standard Oil Company under license.

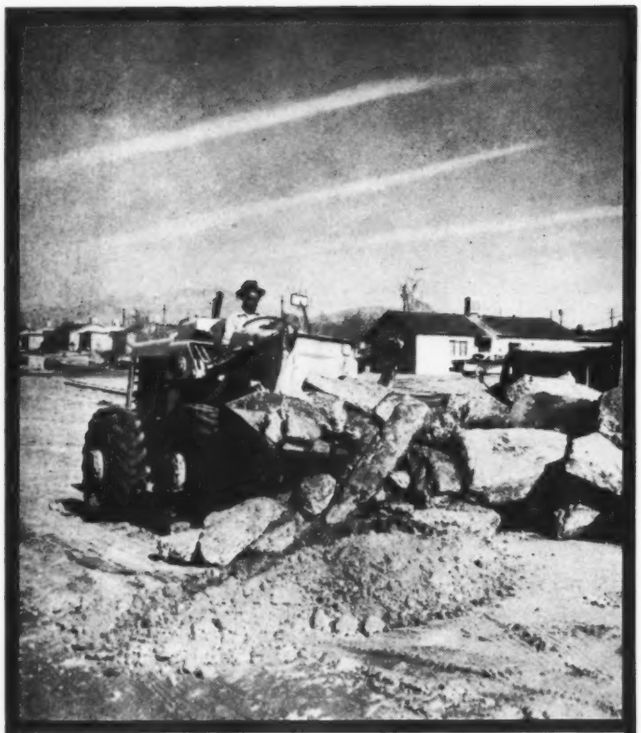
STANDARD

STANDARD OIL COMPANY (Indiana)



Standard's Bob Buel checks conveyor belt used to move 450 tons of crushed rock per hour more than a mile. Bearings on conveyor are lubricated with AMOCO Lithium Multi-Purpose Grease.

←For more facts, circle No. 225



for Excavating..

No matter what the material may be, no matter what the job may be — excavating, grading, backfilling, spreading, landscaping, loading or unloading — your modern "PAYLOADER" is there, ready to dig-in and outproduce any machine of comparable size.

All 4-wheel-drive "PAYLOADER" models are equipped with power-transfer differentials that maintain effective traction on mud, gravel, ice and snow . . . they have "no-stop" powershift transmissions and torque converters, planetary final drives, power steering and 4-wheel power brakes . . . *plus* the exclusive bucket motion with 40° bucket tip-back at ground level and powerful pry-out action.

You now have a choice of three sizes of 4-wheel-drive "PAYLOADER" tractor-shovels (carry capacity up to 9,000 lbs.; bucket sizes up to 4 cu. yds.). Ask your Distributor to prove "PAYLOADER" superior performance *on your work.* The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Ill.

96A

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

for Handling..

Put a "PAYLOADER" on the job and it can travel and work on pavement, over curbs and sidewalks without damage to the surface. It can carry and lower bulky pipe into trenches, carry and spread cushion sand or gravel; backfill and level the trench; pull shoring, load excess dirt into trucks — all by moving quickly to where it is needed. With a complete line of attachments, a "PAYLOADER" can be profitably employed every minute of every day.

In a "PAYLOADER" you also get the most advanced, most proven tractor-shovel features. That's the reason for its big success and acceptance — nothing can match the versatility, mobility and productive capacity of the 4-wheel-drive "PAYLOADER" models.

Whatever type of work you contract, you'll need a tool that can *do many jobs* quickly and easily. Ask your Distributor to prove "PAYLOADER" superior performance *on your work.* The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Ill.

96B

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

for Trenching..

Attached in minutes in place of the "PAYLOADER" bucket, the hydraulic back-hoe attachment operates in a 190° radius. With a wide range of bucket types and digging widths, you can cut vertical walls, square corners and hold an accurate grade. This cuts expensive hand-finishing time and produces a neat, finished job for foundations, trenches, service lines, bell holes and footings.

Right angle digging and dumping permits handling a greater variety of jobs under unusual conditions. Four simple, independent hydraulic control levers operate the husky boom and dipper stick. Twin-boom hydraulic cylinders provide a powerful digging and break-out force while hydraulic, self-leveling stabilizers relieve the tractor of digging and lifting strains.

For big production from a single, compact unit, ask your Distributor to demonstrate this "PAYLOADER" heavy-duty tractor-shovel and hoe combination *on your work*. The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Ill.

96C

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

for Construction..

Because it travels fast, under its own power, one man and a "PAYLOADER" make a highly mobile "crew" to handle many scattered jobs in a single day. With the quickly interchanged fork lift attachment as an example, lumber, sheeting, pipe, logs, palletized loads or large individual pieces are handled in and out, on-the-job.

Other useful attachments include the crane hook, pusher plates, land clearing rakes, winches, pick-up sweeper, special buckets of many types and sizes and the patented DROTT "4-in-1" bucket that combines shovel, clamshell, scraper and bulldozer action in a single bucket arrangement and is available on rubber on "PAYLOADER" tractor-shovels exclusively.

Whatever your job may be, a powerful 4-wheel-drive "PAYLOADER" can help you finish it quickly and economically. Size for size, no rubber-tired tractor-shovel can match "PAYLOADER" versatility and production capacity. Ask your Distributor to prove "PAYLOADER" performance *on your work*. The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Ill.

96D

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

For more facts, use Request Card at page 18 and circle No. 226

Both the Cat D9 push tractor and the Cat DW20 tractor, helping the Cat scraper to a full load during channel excavation, are equipped with turbochargers on their engines.

(Continued from page 39)

came in and salvaged merchantable timber. The clearing contractor then stacked the remaining brush and trimmings into piles and burned them in the cleared areas.

In the areas which formed the bases of the levees, all stumps and roots were grubbed out and removed. An Ateco root rake on one of the tractors was very useful in this operation.

Clearing for the levees started at the outer edge, and the stumps, unburned logs, and other materials were dozed in toward the channel. The spoil banks along both sides of the channel are high enough to prevent this material being washed into the channel during flood periods.

Building levees

The protective levees were built with a net slope of 4 to 1 on the channel side, 5.5 to 1 on the outside, and with a 10-foot crown. The flat top was widened to 20 feet to serve as a roadway by steepening the outside slope. Where the levee was 16 feet high, about average for this contract, its base covered a width of 162 feet.

Since there is usually some settlement in the subgrade as well as a little subsidence of the embankment, the levees were built up from 2 to 2.8 feet above the required net design. At lake crossings, 5 feet was added.

Before levee construction could begin, an inspection ditch 6 feet deep and 7 feet wide was dug in the base of each levee. This ditch, which lies along the levee centerline, was dug by a Bucyrus-Erie 22-B dragline with a Hendrix ¾-yard bucket. This rig belonged to the clearing contractor. The purpose of the inspection ditch was to observe underground logs, unsuitable base material, seepage lines, pipes, and other things that might have a future effect on the levee. The inspection completed, this trench was backfilled and compacted by a tractor.

The final step in preparation for the building of the levee embankment was the plowing of the levee base with a big Rome disk. This plowing was required to penetrate a minimum of 6 inches deep and was intended to provide a bond between the subgrade and the levee embankment.

Most of the material for the levee embankments came from borrow pits adjacent to the levees on the inside or channel side. The Page draglines stood at the edge of the levee base, excavating the material from the pits and casting it into place on the embankment, with their 145 and 150-foot booms, the rigs were able to cast almost the entire section of the levee without having to do any recasting.

The big draglines were powered by two diesel engines. The main power unit, a Page Model 450, 5-cylinder engine, drives all of the operating machinery except the swing. The second engine, a Page Model 250, 3-cylinder engine, operates a generator that provides electric power for such things as swing motors, air compressors, blowers, pumps, and lighting. Two 37.5-hp electric motors swing the big crane.

Clay left in borrow pit

The contractor was required to leave a blanket of at least 3 feet of clay in the bottom of all borrow pits to seal off the underseepage in times of high water. In case too much clay was excavated, he was required to replace the clay to the 3-foot depth.

To avoid any such costly error, the

THE A-W 3-WHEEL ROLLER

Available in 8-11, 10-12, 12-14 ton models. The left drive roll is keyed to the axle shaft; the right turns on heavy duty bushings independently of the left roll and axle. Power is automatically transferred from the slipping roll to the opposite roll by a torque-proportioning-type differential which assures traction even under the most adverse conditions.

THE A-W TANDEM ROLLER

Available in 5-8, 8-12 10-14 ton models. All models have full-width seat and dual controls. Forward and reverse levers are located at each side of platform, with steering lever at center permitting operator to sit where visibility is best.

THE A-W PORTABLE TANDEM ROLLER

3½ to 6 ton, showing optional towing equipment. Full hydraulic steering. Powered with 4-cylinder gas engine.

AUSTIN-WESTERN ROAD ROLLERS offer you smooth power, balanced weight, finger-tip control

Faster, more efficient compaction and finishing are yours with the new line of A-W Road Rollers. From power unit to final drive, all are engineered to give the operator complete confidence in his machine. Regardless of the work—subgrade, crushed stone, soil cement or black-top—these rollers will do a top-flight job.

All A-W 3-wheel and tandem rollers are powered by your choice of gasoline or diesel engines with 4-speed (regular) or 2-speed (optional) transmissions. Torque converter drives are optional. Drum-type front and rear rolls permit ballast variations in weight up to 4 tons.

Some of the A-W extras that give you better roller performance:

- **Oversize axles and antifriction bearings for longer life**
- **Transmission gears are machine cut heat treated**
- **Transmission is equipped with antifriction bearings**
- **3-wheel rollers have heat-treated alloy steel bull pinions and high-strength steel bull gears**
- **Tandem rollers have machine-cut, heat-treated final drive bevel gears and pinions**
- **Outside edges of finished rolls are beveled to prevent marks in hot materials**

An important advantage to owners of both A-W 3-wheel and tandem rollers is the fact that 75% of all driving and steering mechanisms are interchangeable. Get all the facts from your nearby Austin-Western distributor or write to us for them.

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON

AUSTIN-WESTERN WORKS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division
OTHER DIVISIONS: Eddystone • Lima • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Standard Steel Works • Madsen • Pelton
AURORA, ILLINOIS, U.S.A.

For more facts, use Request Card at page 18 and circle No. 227

contractor carefully tested entire borrow areas by making borings that showed the depth of the clay strata. The excavations were held well on the safe side of the required cover.

As the big draglines dumped their 7-yard buckets of material on the levee embankment, a Caterpillar D6 tractor-dozer leveled off the material and kept it to the shape of the finished levee. This tractor operating on the embankment also provided a limited amount of compaction. Dropping the big loads of earth from the bucket several feet above the fill also helped with the compaction.

Scrapers start channel

Excavation of the auxiliary channel between the levees was a joint operation of scraper spreads, small draglines, Euclid Trac-Trucks and the big draglines. Throughout most of this area, the top strata was a silty clay suitable for the levee embankments. Below this was silty sand and sand unsuitable for the embankments.

The scraper spreads and Trac-Trucks took the first cuts on most of the channel excavation and hauled this usable material to the levee embankments. Then the big draglines excavated the remaining sandy material, casting it into spoil banks beside the channel.

The scrapers and hauling units not only built the outer toes of the levees to save recasting with the draglines, but also supplied material in the areas where the borings showed that the borrow pits were too shallow to supply the required amount of material. Elimination of these double-casting jobs with material paid for as both channel excavation and levee embankment was a major factor in the success of the job.

One of the spreads of scrapers handling this work was made up of three Caterpillar DW20 scrapers, push-loaded by Caterpillar D8 and D9 tractors, which also doubled on other jobs. The other spread consisted of a Caterpillar DW21 and two Euclid scrapers with a Euclid TC-12 push-tractor.

Some of the excavation and embankment was also handled by three draglines, using Hendrix 3 and 4-yard buckets, which loaded a spread of 12 Euclid bottom-dumps. These hauled to the levee embankments in the same way as the scrapers.

Drainage channels

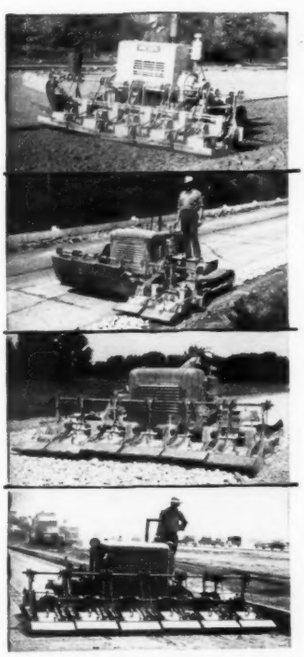
Because the levees intercept certain natural drainage channels, it was necessary to construct drainage ditches along the outside of the levees to conduct water down to the Sunflower River. One of the largest of these ditches connects Lake George with the Sunflower River on the east side of the auxiliary channel. This ditch, about 2.2 miles long and 20 feet deep, has a 75-foot bottom with 2 to 1 side slopes.

(Concluded on next page)

The second Page walking dragline on channel excavation is this Model 621S with 145-foot boom and Hendrix 7-yard bucket. One Page 5-cylinder engine drives all but the swing of the main operating gear; another supplies power for such things as lights, air compressor, blowers, pumps, and swing motors.

ON ANY MATERIAL...ANYWHERE!

VIBRO-TAMPER guarantees*required density ... mechanical PERFORMANCE!



(1) SHOULDER COMPACTION USING 5 SHOES.
(2) WIDENING—2-SHOE COMPACTION.
(3) 10" BASE COURSE TO 8"—1 PASS.
(4) RUNWAY—COMPACTING BETWEEN FORMS.

Here's single-lift compaction efficiency that assures you an average of 1000 sq. yards per hour on courses from 4" to 15" thick... and you get 95% or better modified proctor.

Vibro-Tamper is built ruggedly to run around the clock with down-time limited to scheduled service periods... and it's so simple to run that no assigned operator is needed.

Materials—Seven years in the field on jobs from Maine to Missouri indicates that you can expect amazing compaction efficiency on almost any material except mud and clay.

REQUEST BULLETIN VT 6-4

*See your Vibro-Tamper dealer for express warrantee.

THE INTERNATIONAL VIBRATION CO.
16701 WATERLOO ROAD IVanhoe 6-0680 CLEVELAND 10, OHIO

For more facts, use Request Card at page 18 and circle No. 228

Armed with a Crossville Machine & Tool Co. clearing blade, a Cat D8 helps clear the dense hardwood forest in the path of the auxiliary channel. The blade's lower edges cut trees at or below ground; the projecting arm pushes over trees weakened by the saw. Heavy guards protect the operator.

Where the levee intersects a natural drainage channel, drainage ditches are built along the outside of the levee to bring water to the Sunflower River. The crane in the background excavates the channel while the P&H sets M-112 sheet piling to prevent erosion in the ditch bottom.

10,000 MILES

U.S.A. PAKISTAN

"We shipped our GMC's 10,000 miles to handle this truck-killing job"

Oman-Farnsworth-Wright report on 114 GMC's working their giant Pakistan construction job

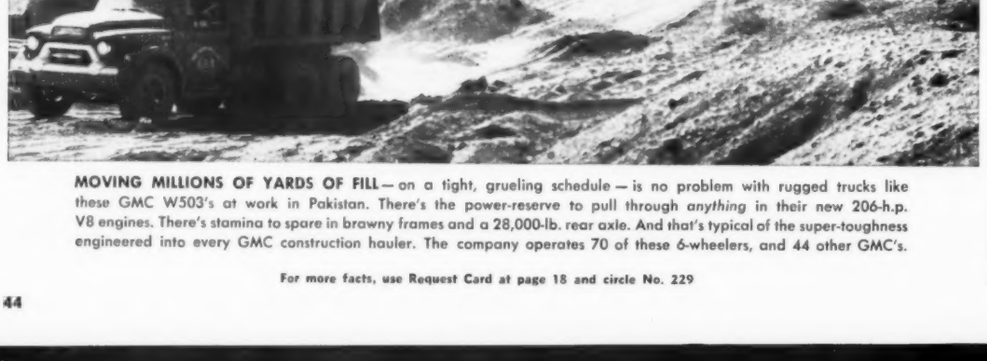
You have to have real confidence in a truck to ship it nearly half way round the world for a vital job.

"We knew GMC's were our best bet," says the report. "After all, they've been breezing through Oman Construction Company's biggest projects in the U. S. since 1929. And they've never had to be pampered."

How well have they stood up on the grueling Pakistan job? Though many of them work 24 hours a day – through 7-day weeks – under far from ideal conditions – they've kept the fast-moving operation right on schedule. "The GMC's have certainly lived up to our expectations," says the organization.

Actually, that's pretty typical of GMC users' reports. You see, every GMC 6-wheeler is designed and built for the toughest job in the construction field. You can collect their money-saving – money-making – benefits right up to 90,000 GCW. See your GMC dealer!

GMC TRUCK & COACH—*A General Motors Division*



MOVING MILLIONS OF YARDS OF FILL— on a tight, grueling schedule — is no problem with rugged trucks like these GMC W503's at work in Pakistan. There's the power-reserve to pull through *anything* in their new 206-h.p. V8 engines. There's stamina to spare in brawny frames and a 28,000-lb. rear axle. And that's typical of the super-toughness engineered into every GMC construction hauler. The company operates 70 of these 6-wheelers, and 44 other GMC's.

For more facts, use Request Card at page 18 and circle No. 229

(Continued from preceding page)

Construction of this drainage channel was similar to that of the main channel, but the lower end was not opened immediately for fear of excessive erosion of the ditch bottom in case of high water. Later, a crew with a P&H ¾-yard crane set and drove a series of steel sheet-pile dams across the ditch bottom to control the erosion.

The lowest of these structures was made of M-112 sheet piling, 15 feet long, driven by a Vulcan 2,000-pound drop hammer handled by the P&H crane. The others, of similar construction, were built with 12-foot-long piles. The ends and downstream sides of these control structures were protected with riprap.

Several underground pipelines and county roads crossed the floodway within the limits of this contract; the pipelines had to be reconstructed to sufficient depth to get below the channel and raised to cross the levees, while new bridges had to be built for the county roads.

The crews operating the big draglines worked three shifts per day to keep the machines in operation around the clock. The other crews worked two 10-hour shifts per day. With all of the machines in operation these long days, the crews moved as much as 50,000 yards of material per day. Artificial illumination from light towers powered by three Caterpillar 10-kw generators and three Kohler 1.5-kw generators made it possible for the night crews to operate at almost the same efficiency as daylight crews.

Supervising the entire operation for Pioneer Contracting Co., Inc., was general superintendent G. N. Hall. His staff included superintendent Allen Bodron and B. G. Taylor in charge of the casting operations, and J. A. "Red" Forrester in charge of the hauling operations.

The Vicksburg District of the Corps of Engineers had William H. Deese, area engineer of the Greenville Area, supervising the project. The chief inspector for the Corps was William H. Gray. The district engineer of the Vicksburg District is Col. Milton P. Barschdorf. THE END

Huge new industrial park has mile of dock frontage on Mississippi River

Dock construction and work on the Ormet Alumina plant at the center portion of the 5,000-acre McGraw Terminal at Burnside, La., make big changes in this agricultural area along the Mississippi.

One of the most ambitious private construction programs in the swiftly changing south is for a 5,000-acre industrial park at Burnside, La., that will have a $7 million dock with more than a mile of frontage on deep water in the Mississippi River. Industries locating in the park may well develop the area into a leading processing or heavy manufacturing center, while the dock, accommodating ocean-going vessels as well as river barges, may help develop a new international port.

The dock is being rushed to completion this summer by F. H. McGraw Co., engineering and construction firm of New York City, for McGraw Terminal, Inc., a wholly owned subsidiary that will operate the park. A gantry crane and conveyor systems will make it possible for 1,000 tons of material to be unloaded at the dock hourly. And provisions are being made so that this rate, many times greater than that at many major Gulf ports, can eventually be doubled.

The huge dock is only one of several facilities now being constructed at the site. Most of the park area has been cleared of timber and sugar cane and is being readied for the construction of new plants. One of the first to locate at the terminal is the 350,000-ton capacity plant of the Ormet Corp., owned by Olin Mathieson Chemical Corp. and Revere Copper & Brass, Inc. Occupying 1,000 acres, it will be capable of producing 180,000 tons of primary aluminum per year when it is completed in 1958.

Other construction now going on includes work on water treatment facilities to handle large quantities of river water, a sewage disposal plant, facilities for gas to be piped into the area for industrial purposes and several housing developments that are taking shape in the vicinity of the park.

While the park is located near the 4-lane Airline Highway between Baton Rouge, 25 miles upstream, and New Orleans, 60 miles downstream, the developer plans to have additional roads built to the site for use by trucks. The main line of the Illinois Central Railroad also runs nearby, and spurs will be built into the new park.

A number of things are combining to make the area attractive enough to capture the interest of several large firms. First, the site is underlaid with a heavy stratum of Pleistocene clay, which will make it less expensive to drive footings and pilings for plants in the park. Also, the land is level and higher than average, and protected by government-maintained levees, and a large supply of public power will be available to the site at low rates.

. . . The new model 104, with full 1½ cu. yd. capacity and 4 wheel drive, is the latest in the constantly expanding TROJAN line . . . Built to give fast, safe and economical performance on the toughest jobs, it is ideal for all bulk material handling operations. Perfect balance permits equal effectiveness when working with dense and heavy *or* light and bulky materials . . . We're so sure that the '104' can outperform any comparable machine on the market that we'll gladly demonstrate *any place* and *any time* at your request!

Check These Important TROJAN Features!

REVERSE CURVE SAFETY ARMS . . . for full 360° vision at all times with absolute personal safety for operator.

ALLISON TORQMATIC TRANSMISSION . . . for fast, easy shifting-*forward or reverse*-at full power without foot clutch.

STRAIGHT LINE HORIZONTAL THRUST . . . allows constant crowding of pile while maintaining full traction and steerage.

INDEPENDENT BUCKET ACTION . . . lets you fill buckets to heaping every time–even from windrows or low piles.

LOW LOAD CARRYING POSITION . . . gives greater stability—allows faster, safer travel with far less spillage.

FASTER TIME CYCLE . . . is the natural result of these features. Faster work means greater job profits!

TROJAN* TRACTOR SHOVELS
*REG. U. S. PAT. OFF.
YALE & TOWNE 2 & 4 Wheel Drive Front-End Loaders
AD NO. 44-26

CONTRACTORS MACHINERY DIV., THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK; SAN LEANDRO, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 230

Hot-mix plant tops rated output for resurfacing project

Depending on a hot-mix plant that operated at or above its rated capacity of 180 tons per hour a good part of the day, a contractor was able to turn out about 1,600 tons of material per 11-hour day for a bituminous resurfacing project.

This 27.5-mile job by Green Construction Co., Des Moines, Iowa, was under the second phase of Iowa's pavement widening program. Green held two connecting contracts on State Routes 92 and 28 between Winterset and Des Moines, and together they required more than 50,000 tons of bituminous mixture. Both contracts came to about $600,000.

Green set up a new Pioneer asphalt plant beside a rail siding at Bevington, Iowa, near the mid-point of the job. The plant consisted essentially of a set of feed bins, a Pioneer 382 dryer and dust collector unit, and a Pioneer 99 central mixing plant.

The asphalt cement was received by rail and transferred directly to the 20,000-gallon storage tank by a Grace booster. A second storage tank at the plant held 10,000 gallons of cutback asphalt for tack coat, and a third tank of the same capacity was used to store fuel oil for the plant.

The asphalt storage tanks, as well as the pumps, lines, and weigh bucket, were heated by a Childers Model D-200 hot-oil heater. This automatic unit maintained the desired temperatures with little or no attention.

Aggregates for the mix were delivered to the job from local sources by truck. A crane with an Owen 1¼-yard clamshell bucket raised the aggregates into a 50-ton, 3-compartment bin. Apron feeders and calibrated gates at the bottom of the bin fed the desired volume of each size of aggregate to a Pioneer 24-inch conveyor that ran 50 feet to deliver the materials to the dryer unit.

Plant operates electrically

Passing through the dryer of the Pioneer 382 dryer and dust collector unit, the aggregates were dried and heated. A bucket-type hot elevator carried these materials to the gradation unit of the Pioneer 99 central-mix plant. The proper proportions of the dried aggregates were then fed to the continuous pugmill mixer where they were combined with the asphalt cement. The finished mix was fed through a hopper to waiting trucks that hauled to the road.

With the exception of the pugmill, the plant units were electrically operated. The pugmill was powered by

How a cost-beating, cy
can "unbind" yo

A TD-24 starts and gets "ready to run," seconds-fast. Morning, noon, or any other time you shut down the TD-24's diesel engine, you restart in seconds—and save yard-moving, wage-costing minutes! Exclusive International gasoline-conversion diesel starting does it—and the combustion-heated engine is ready to run as a diesel, without "gumming the works" with raw fuel!

TD-24 Cerametallic engine clutch eliminates time loss and upkeep cost of temperature-sensitive, "service-nervous" type clutches! You get the simplicity of long-familiar clutch design. You get the operating ease, temperature-immunity, and power-transfer efficiency of International Cerametallic facings. You get the instant readiness to operate perfectly when cold—plus heat-defiance for clutch-mauling jobs like 'round-the-clock shuttle-dozing.

TD-24 on-the-go shifting is a "double-barreled" cycle-speeder. The exclusive TD-24 two-speed planetary system gives instant, stall-preventing Hi-Lo shifting without declutching, in either the Torque-Converter or Gear-Drive models. And in the Gear-Drive model, you get two-direction "no-stop" shifting with exclusive synchromesh transmission.

TD-24 exclusive Planet Power steering eliminates load-limiting "dead-track drag"—gives full-time "live" profit power on both tracks. It's more than total engine hp or weight that

Announcing VM VALUE MEASURED

The exclusive equipment buying plan that value-measures used machinery and its components before you buy!

See VM buys now at your International Construction Equipment Distributor!

...e Pioneer asphalt plant, electric but for the engine-driven ...mill, has a 3-compartment bin fed by crane and clam... bucket. Aggregates go by conveyor from the apron ...er to the dryer and dust collector, then to the gradation ... and the bins of the Pioneer No. 99 central-mix plant. ... has a continuous pugmill that discharges to a truck in ...pit.

New asphalt plant, turning out about 1,600 tons per day, supplies two pavers putting down binder, surface for widened road

A load of the hot-mix material is delivered to the Barber-Greene finisher by a Ford 600 tandem-axle truck. The B-G unit put down only the surface course, following another paver that handled the binder course.

a Caterpillar D326 engine. Power for the remaining plant units was generated by a Caterpillar D337 power unit, while a Caterpillar D311 unit served as emergency standby. When the number and length of delays was not excessive, the contractor hit an average production of about 1,600 tons of material per 11-hour day.

Use two pavers

The surface of the concrete pavement was swept clean and tacked with RC-O cutback asphalt at a rate of 0.05 to 0.08 gallon per square yard. This tack was applied by an Etnyre 2,850-gallon distributor pulled by a Ford F800 truck. The tack coat was immediately sanded by a spreader to blot the cutback and permit traffic to continue using the road.

The asphaltic-concrete surfacing consisted of a binder and a surface course, both 1½ inches thick and 24 feet wide, consisting of the same mix. Before the binder course was laid, a wedge course, 3 inches thick at the outside, was placed on the outside half of the roadway on all curves. This wedge served to eliminate the crown of the original pavement and improved the superelevation of the curves.

Green used two pavers to lay the mix. One was a Pioneer bituminous paver, the other, a Barber-Greene. One of the machines was kept on the binder course while the other followed, laying the surface course.

Since the specifications required that only one side of the road could be tied up at a time and traffic had to be carried through the job at all times, the pavers continued laying one side for an entire day. At the end of the day, a Transport trailer picked up the pavers and brought them back to the starting point so that they could lay the other half of

(Concluded on next page)

All priming and tacking operations are handled by this Etnyre 2,850-gallon distributor pulled by a Ford 800 tractor. Here, it supplies the hot cutback for a hand-priming job on an approach road.

...cycle-speeding TD-24

...your profit squeeze!

Flores and Perry, Laton, California, depend upon three International "75" Payscraper® units and a TD-24 Torque-Converter crawler—to fulfill their 8-mile grade-raising subcontract, on Central Valley Highway south of Hanford. TD-24 push helps boil-in 20 cu yd heap-loads, in only 42 seconds!

...ng, ...ive ...get ...ve ...ni- ...ves ...ks. ...nat

counts—watch how "dead-track drag" limits any king-sized steering-clutch crawler to what it can handle on turns. Then watch how years-proved Planet Power steering gives the TD-24 full-time, both-track power—to pull or push extra-big loads on the turns or straight ahead, uphill or down!

TD-24 control ease puts record daily production at your operator's fingertips. Cool and safe flush-deck design, control-tower vision, and reach-easy fingertip controls all increase operator comfort and performance. Never before has big crawler work-power been so load-responsive—or record work-production so easy to achieve!

Prove positively your profit-margin widens—with geared-and-steered-for-action TD-24 power giving you the success-margin of push or pull! See your International Construction Equipment Distributor for a TD-24 demonstration!

"The TD-24's 2-speed track steering holds you in 'dozing position with no slide-slip or power loss in turning," states Operator Jack Campbell for Owner J. H. Marshall, Clovis, New Mexico. The Marshall TD-24 is shown dozing tough caliche rock for road surfacing.

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors ... Self-Propelled Scrapers ... Crawler and Rubber-Tired Loaders ... Off-Highway Haulers ... Diesel and Carbureted Engines ... Motor Trucks ... Farm Tractors and Equipment.

←For more facts, circle No. 231

(Continued from preceding page)

Initial rolling of the bituminous surface is handled by this Ferguson 12-ton tandem roller.

the roadway the next day.

Both steel and rubber-tire rollers were used to compact the surfacing. The first pass was made with a Ferguson 12-ton tandem roller. The surface was then compacted with a 9-wheel, self-propelled, rubber-tire roller. The kneading action of the rubber tires seemed to densify the material and close up the surface voids. A final rolling with a Ferguson 12-ton tandem took out any irregularities left by the pneumatic roller.

In an attempt to prevent cracking through at the joints between the original pavement and the concrete widening strips, the contractor placed welded wire fabric over the joints on one 5-mile section. The 6×3-inch No. 10 fabric was placed in 5-foot 8-inch-wide strips between the binder and surface courses of the pavement.

Personnel

Supervising the operation for Green Construction Co. were superintendent Willis Abbott, plant foreman O. E. Bast, and road foreman Kenneth Davis. Resident engineers for the Iowa State Highway Commission were Lowell Richardson of the Council Bluffs District on the State Route 92 portion and Fred Brockmann of the Des Moines District on the State Route 28 contract. C. L. Gleason is construction engineer for the Commission, and John G. Butter is chief engineer. THE END

Division and district engineers named by Corps

The U. S. Army Corps of Engineers has assigned Brig. Gen. Frank M. Albrecht as South Atlantic division engineer with headquarters in Atlanta, Ga.; and appointed Col. Paul D. Troxler district engineer at Jacksonville, Fla.

Gen. Albrecht, who succeeds the retiring Brig. Gen. Henry J. Hoffer, was formerly in the office of the deputy chief of staff for logistics. Col. Troxler, who has been serving in the office of the army chief of engineers, succeeds Col. Elmer E. Kirkpatrick, Jr., who has been reassigned to the Mediterranean division of the Corps at Leghorn, Italy.

Brig. Gen. Louis J. Rumaggi has become North Central Division engineer at Chicago, Ill., succeeding Brig. Gen. Paul D. Berrigan, who retired. Gen. Rumaggi was formerly chief of staff, Sixth Army, Presidio of San Francisco, Calif. The division he has been assigned to supervises the military and civil works activities of the Corps in the north-central United States. Its responsibilities are the design and supervision of construction of the U. S. portion of the St. Lawrence Seaway.

Col. Charles B. Schweizer will become district engineer for the Corps in St. Louis, Mo., effective in September; he succeeds Col. George E. White, Jr., who retired. In the mean time, Col. Carl M. Sciple will be acting district engineer until Col. Schweizer returns from Korea.

A new special assistant to Col. Clarence Renshaw is Clarence C. Burger. He will be in the New York City office of the North Atlantic Division.

Two elected to board of Walter Kidde firm

E. G. Robbins and Frank L. Whitney have been elected to the board of directors of the Walter Kidde Constructors, Inc., engineers and builders of New York and Houston. Robbins, a member of the firm for 30 years, is vice president in charge of construction.

Whitney, vice president in charge of engineering, was formerly eastern district chief engineer for the H. K. Ferguson Co.

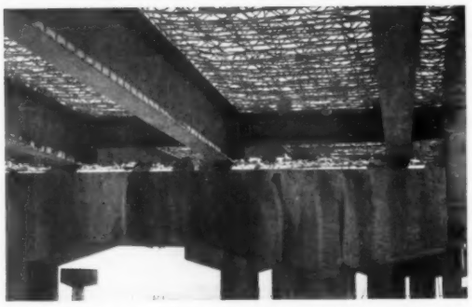
HAYMAKER: Big 750-lb. hammer, powered by Jaeger "600" rotary, delivers 22,000 ft. lb. wallop; breaks old concrete on San Francisco-Oakland Bay bridge toll plaza. Slab was 6" thick, with double curtain steel reinforcement.

1-2 and out with Jaeger air

On Oakland Bay bridge improvement job, this Jaeger "600"-powered pavement breaker delivered a neat knockout punch. Concrete was jarred completely clear of double curtain reinforcing steel, eliminating usual nasty clean-up job. Hefty 22,000 lb. wallops (45 to 60 a minute) did it.

Keeping full air pressure behind the 750 lb. hammer was easy for the Jaeger 600 cfm rotary. Its Model 6-71 GM diesel engine never ran faster than a fuel-saving, wear-saving 1650 rpm. Other "600" compressors, with the very same engine, need 100 to 150 rpm faster full load speed.

You get this same slow-speed, efficient performance, saving fuel, fpm of engine piston travel and thousands of compressor revolutions per hour, in Jaeger 125, 250 and 365 cfm compressors, too. For example, the Jaeger "365", with 50 cfm more capacity than "old standard" 315 cfm units, operates at 1700 rpm instead of 1900. See your Jaeger distributor for full data or send for Catalog JCR-5.



KNOCKOUT: Double curtain reinforcing steel is completely cleared of concrete by the breaker—a clean job that saved time and cost. With Jaeger air power, special heavy duty tool broke up as much as 700 cu. yds. of reinforced concrete a day.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS

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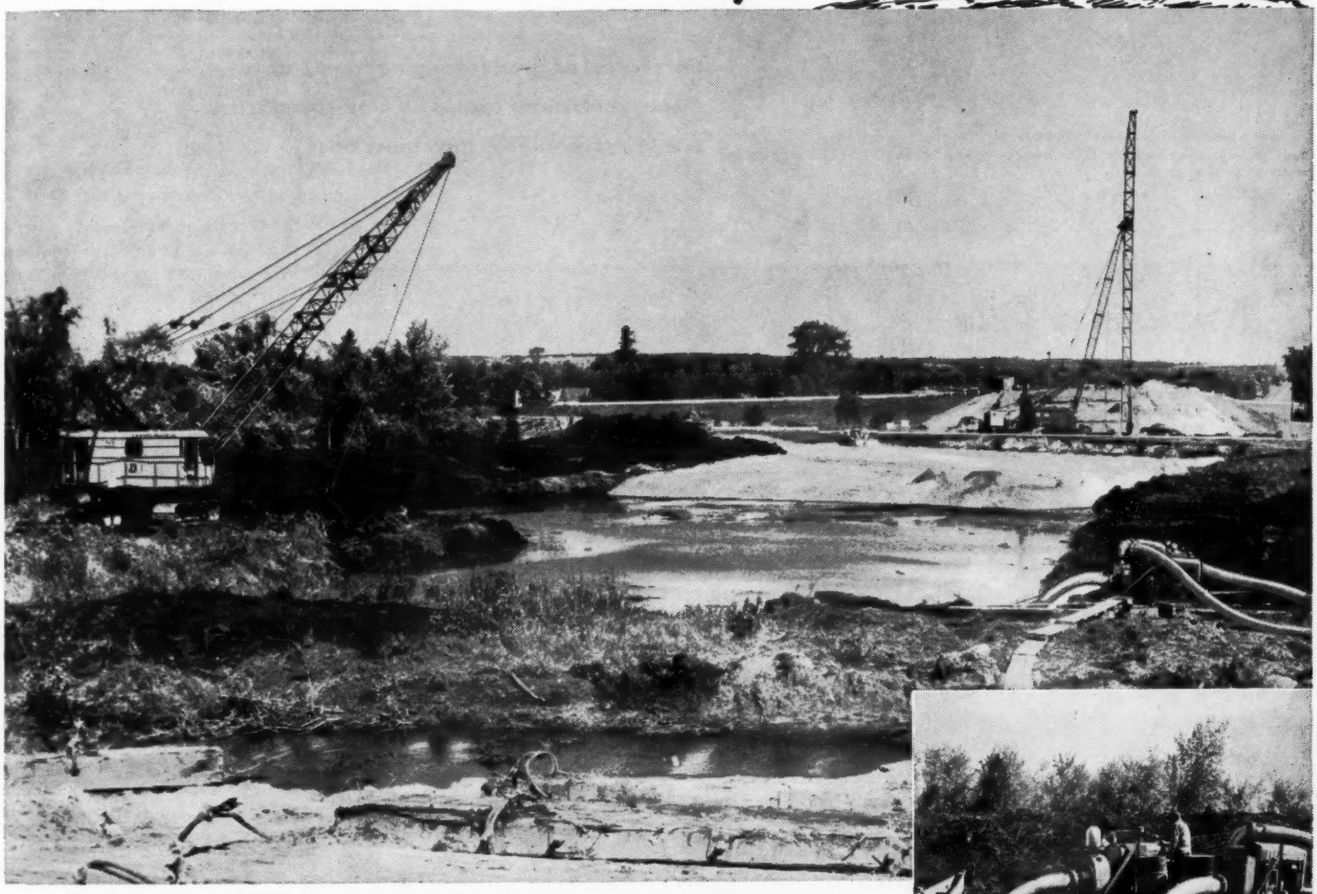
ROAD PUSHED THROUGH
1,700 Foot Swamp Area



This swamp area was de-mucked and filled to provide a roadbed for a four-lane arterial route in Utica, N. Y. Marlow self-priming pumps, seen in the right foreground, were used to control and remove water.

Two of the three big, engine-driven, self-priming contractor pumps used on the project for dewatering operations are shown above. D. W. Winkelman Co., Inc. used two 8-inch and one 10-inch Marlow self-primers on the job.

Marlow Pumps Control Water Throughout De-mucking Operations

D. W. Winkelman Co.,Inc., of Syracuse, is currently working on a 1.2-mile portion of a north-south arterial route in Utica, N. Y. The construction of this $4,474,259 segment of the road, with four lanes, is scheduled for completion in December. 1958.

One of the major problems the Winkelman organization tackled on this job was a swamp area 1,700 feet long. Muck went down as deep as 15 feet below ground level. A crane with a 70-foot boom and dragline bucket was used for "muck-out" operations. Approximately 1,000,000 cubic yards of barrow was used as fill.

During the entire "muck-out" and fill operation, two Marlow 8-inch and one 10-inch, engine-driven, self-priming, contractor pumps were used to control and remove water from the area. With all three pumps in operation at the same time, they handled up to 540,000 gallons per hour! In emergency situations, the three Marlow self-primers were capable of pumping 558,000 gallons per hour.

If you have a tough dewatering problem, look to Marlow for your answer. Marlow builds a complete line of AGC-rated contractor pumps as well as famous "Mud Hog" diaphragm pumps for handling muddy and trash laden liquid. Marlow pumps are readily available from three factories and from hundreds of dealers in all localities. Look under the heading, "Marlow Pumps," in the "Yellow Pages" of your classified telephone directory for the name of your Marlow Dealer.

For complete information, write today for a copy of Contractor Pump Bulletin C-04.

Marlow PUMPS

7-126

DIVISION OF

BELL & GOSSETT CO.

Midland Park, N. J.

Morton Grove, Illinois Longview, Texas

For more facts, use Request Card at page 18 and circle No. 233

A screed attached to a Lima crane levels the concrete on the 11½-foot-high curves of the oval track, as a paver dumps a bucket of concrete on another section of the curve.

Concrete test area provides network of good to bad roads

Cars travel on grades ranging from 7 up to 60 per cent; outer curves on high-speed track are 11½ feet higher than inner ones

One of the largest privately financed earthmoving projects has recently been completed for the Ford Motor Co.'s proving grounds near Romeo, Mich. To move the record 4 million cubic yards of earth on the 3,880-acre test area, more than 100 major pieces of equipment were used—bulldozers, bottom dump trucks, scrapers, draglines, sheepsfoot rollers, and 50-ton compacting machines.

The foremost test course used is the high-speed track, a 5-mile, reinforced concrete oval, five lanes wide and banked so steeply that the outer curves of the pavement are 11½ feet higher than the inner. Adjacent to this is a 2½-mile straightaway for checking acceleration and braking performance.

Durability roads

To provide a network of good, medium, and bad roads for routine 20,000 to 60,000-mile car-endurance tests, three durability routes were built. The first of these, a basic durability route, is 7.2 miles long. Here engineers dished out concave curves, and deliberately built bumps into the paved surface to resemble the road hazards commonly encountered by the motoring public.

This route is supplemented by a hill durability route to test a vehicle's pulling power. The 2.3-mile-long road is spiced with sharp turns and includes a variety of test grades up to 25 per cent. The gravel durability route provides 8.1 miles of rough, winding road over rolling terrain with grades up to 9 per cent. All three routes are 22 feet wide.

Construction of hill test grades further challenged the road engineers. These grades, ranging from 7 to 60 per cent, are on the sides of a 1,167-foot hill, the highest in southeastern Michigan. The 60 per cent grade, used as a testing mill for Ford-developed military vehicles, is so steep that a man on foot must wear rubber-soled shoes to climb it.

Paving operations

The flat high-speed oval track, the largest single operation, required nearly 200,000 square yards of 9-inch-thick reinforced concrete. Measuring 60 feet wide and 5 miles long, the track's curves are so constructed that test drivers can travel at 140 mph without feeling any sway. The 36-

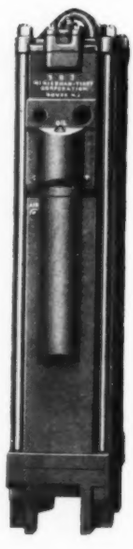
Driving a Pile Every 5 Minutes with a

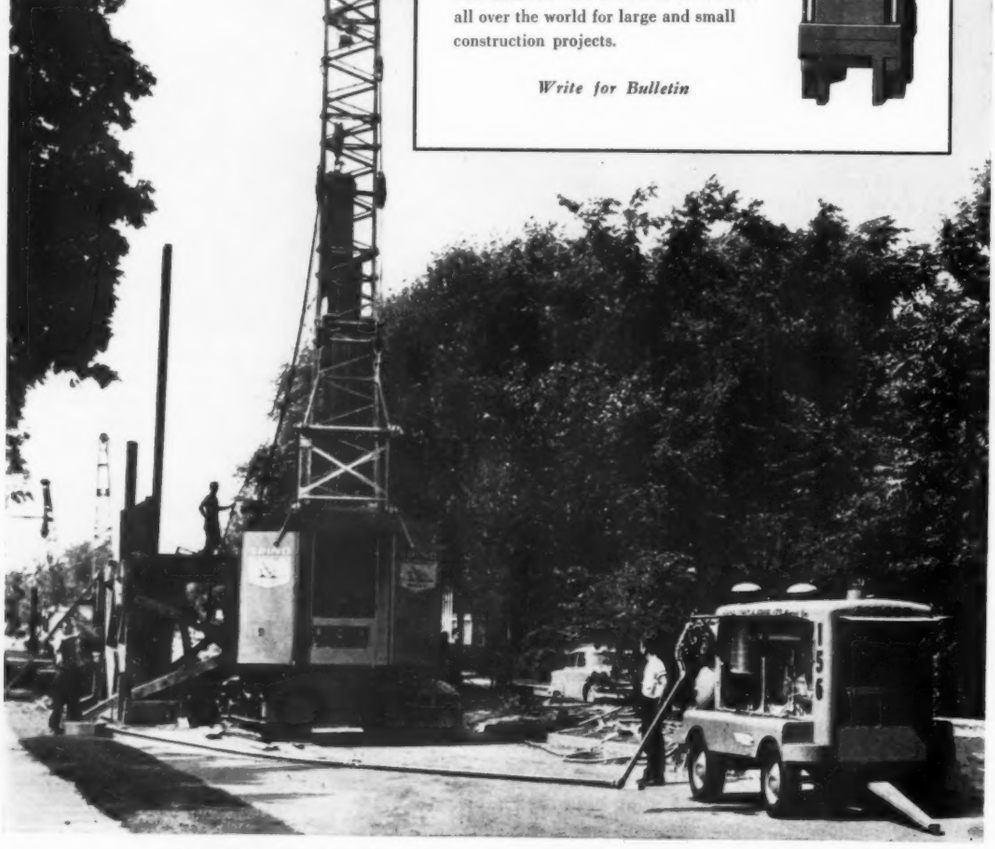
McKIERNAN-TERRY Hammer

In laying a 6-ft 6-in sewer line in Mount Royal, Quebec, Spino Construction and Equipment Ltd. sheeted more than 2,000 ft of trench 30 ft deep through asphalt and clay at an average rate of 100 piles per day. A McKiernan-Terry 9B3 Double-Acting Pile Hammer provided the powerful blows that enabled them to do the job so speedily and effectively. A McKiernan-Terry E4 Double-Acting Pile Extractor was later used to withdraw the piles.

You, too, can be sure of similar, quick pile-driving operations, whatever the type of job, kind of piling or character of soil, if you use a McKiernan-Terry Pile Hammer—the choice of contractors all over the world for large and small construction projects.

Write for Bulletin





McKIERNAN-TERRY CORPORATION

MANUFACTURING ENGINEERS

82 Richards Ave., Dover, New Jersey

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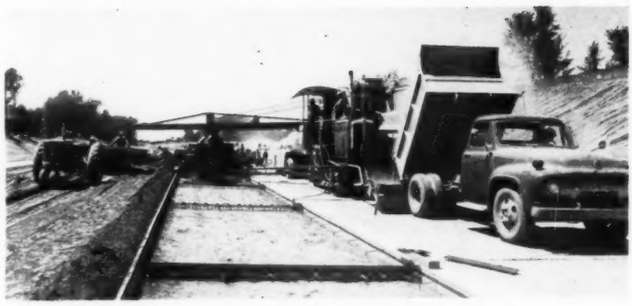
MK-392



The flat 5-lane high-speed test course does not vary more than ⅛ inch at any point. The Ford V-8 truck, right, dumps a batch into the skip of the paver riding on a completed section, as a tractor, left, tows a load of wire reinforcing for the slab.

Workmen spread concrete on a hill-test grade section, ranging up to 60 per cent, on the sides of a 1,167-foot hill, the highest in southeastern Michigan. When completed, the hill will be a testing mill for Ford-developed military vehicles.

foot-wide surface pavement for this track, which does not vary at any point more than ⅛ inch, has paved turnaround pads, 200 feet in diameter, at each end.

Blacktopping operations for the two paved durability roads, required 80,000 tons of bituminous concrete and aggregate binder. Since one of the roads contains a great number of bumps, dips, and patched places, modern asphalt pavers could not be used. Instead, the custom-built hazards were paved by workmen with shovels.

Operational headquarters for the Michigan proving ground covers 160,000 square feet of floor space for office quarters, cafeteria, dispensary, drivers' ready room, and five separate garages. Each garage is equipped with lubrication stalls, wash racks, wheel alignment fixtures, hoists, and stock rooms. At the rear of each garage is a gasoline service station with eight pumps and underground storage tanks with a total capacity of 84,000 gallons.

Testing jobs

With the completion of this track, it is expected that Ford's 300 test drivers will travel approximately 10 million miles this year to evaluate and improve the company's products. Some will be called on to check future designs; others will test-drive current models; and others will test experimental components which could become integral parts of the car of tomorrow.

There are hundreds of different individual tests covering every step of design tryout, but all are directed toward one thing—improving the over-all product. Each driver keeps accurate records of operation and maintenance during a durability run, and later his test car is completely disassembled and all of the parts weighed and closely examined to determine the amount of wear.

All construction at the new proving ground—which brings the total test area for all of Ford's proving grounds to 8,080 acres—was supervised by Ford Motor Co.'s plant engineering office. After planning and layout by the firm's engineering staff, the road facilities were engineered by Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa. S. J. Groves & Sons, Inc., Minneapolis, Minn., was the prime contractor; and paving was sublet to the Alexander Construction Co., Minneapolis. THE END

All-round performer

The rugged Model 14 excels from every angle. This single-cylinder, 4-CYCLE gasoline engine (5.25 hp) pays its way with standout performance over a wide work range. Like Models 9, 19, 23A, it features exclusive Magnematic Ignition for instant starting — under all conditions.

Power partners on progress projects...everywhere!

It's a fact! Briggs & Stratton 4-CYCLE engines are most welcome partners in the front lines of construction progress. They're famous for staying right in the thick of things — running smoothly, surely — regardless of "hard knocks," heat or cold, snow or rain. Insist on these engines (up to 9 hp) for your projects, too — on pumps, compressors, finishers, tampers, concrete saws, generators, elevators . . . scores of other products for progress in construction.

4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES

BRIGGS & STRATTON CORP.
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Authorized Briggs & Stratton service is nearby. Find it in the Yellow Pages of your phone book under "ENGINES—GASOLINE."

Find Us Fast in The Yellow Pages

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This spread of Ingersoll-Rand and Worthington wagon drills, powered by two I-R Gyro-Flo 600 compressors and a Joy 600, sink holes in the cut while a Lima 1201 shovel uses a 4-yard bucket to load blasted rock to a Euclid rear-dump.

Drilling, hauling rigs spur expressway job

Work covers expressway grading, river drive location, construction of temporary bridge for haul units

A big drilling and hauling fleet spearheaded the 700,000 cubic yards of rock and earth removal for a two-pronged job—grading a 2½-mile urban section of the Schuylkill Expressway in Philadelphia, Pa., and relocating more than 7,000 feet of the West River Drive along the west side of the Schuylkill River.

The grading subcontract, awarded to Glasgow, Inc., Glenside, Pa., also called for a temporary bridge to be built over the West River Drive so that haul rigs could deliver fill material from cut sections on the opposite side of the road. Lipsett, Inc., New York, N. Y., is the general contractor on this $7 million job, which will provide six 12-foot lanes, separated by a 4 to 12-foot concrete divider, when the work is finished this December. The 10-inch-thick unreinforced concrete slabs will have 10-foot-wide stabilized outside shoulders.

Roads relocated

Most of the cut areas were located on the west side of the West River Drive, and the fill material was used to build up a new roadway grade along the shoreline, or the east side of the Drive, for a temporary bypass route. Spreading and compacting the fills for the bypass route were Allis-Chalmers HD-20 and HD-21 tractor-dozers and a Buffalo-Springfield 10-ton, 3-wheel roller, respectively.

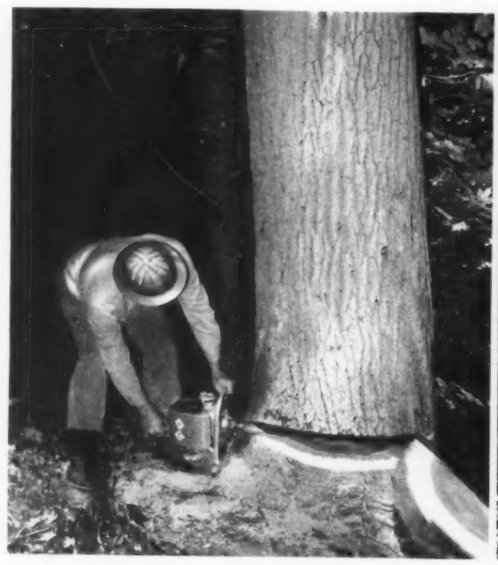
West River Drive traffic will use the bypass while the expressway—part of which coincides with the old West River Drive—is built. Then traffic will use the expressway when the 7,000-foot West River Drive relocation is being completed.

The relocated stretch, skirting the river's edge, will be built up with fill obtained from the river basin. A dragline will handle this last phase of the contract.

Drilling paces work

The expressway earth excavation, which resulted in about 250,000 cubic yards of waste material, was handled by four LeTourneau-Westinghouse 12-yard scrapers push-loaded by a Caterpillar D8 tractor.

Rock work was handled by six Ingersoll-Rand and Worthington wagon drills, which put down the 2¾-inch holes having average depths of 18



Choose from Two NEW HOMELITE CHAIN SAWS...

the 6-Horsepower "Power Twins"

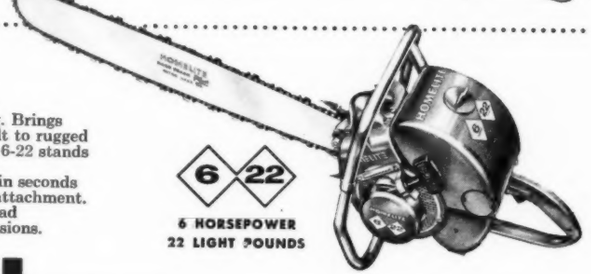
The Homelite EZ-6
DIRECT DRIVE CHAIN SAW

Fastest-cutting direct-drive chain saw made, the 6 horsepower of the EZ-6 makes quick work of trees up to 5 feet in diameter. Famous Floating Power and a light 19 pounds make the EZ-6 easiest of all to handle. Ideal for clearing building sites, repairing storm damage, maintaining rights-of-way.

EZ 6
6 HORSEPOWER
19 LIGHT POUNDS

The Homelite 6-22
GEAR DRIVE CHAIN SAW

Most versatile chain saw you can own, the 6-horsepower, 22-pound 6-22 does everything. Brings down big trees, up to 7 feet in diameter. Built to rugged professional standards, the smooth-operating 6-22 stands up under the grind . . . day in and day out. Money-saving attachments convert the 6-22 in seconds to plunge-cut bow, brush-cutter or clearing attachment. Does any woodcutting job for contractors, road builders, utilities, tree surgeons, park commissions.



6 22
6 HORSEPOWER
22 LIGHT POUNDS

WIN A FREE CHAIN SAW EVERY YEAR FOR LIFE . . . IT'S EASY!

Nothing to buy, nothing to write, no obligation. Just have a free demonstration of the new Homelite Power Twins. You may have three chances to win! GRAND PRIZE: a free Homelite chain saw every year for life, PLUS 25 chain saws given away by Homelite District Offices, PLUS hundreds of chain saws being awarded by Homelite dealers in their own local contests. Register now! Limited to residents of the United States and subject to local state, county and city laws.

HOMELITE PORT CHESTER, NEW YORK
A DIVISION OF TEXTRON INC.
5907 RIVERDALE AVENUE, PORT CHESTER, NEW YORK
Homelite Builds and Sells More Chain Saws than any Other Company in the World
Manufacturers of Carryable Pumps • Generators • Blowers • Chain Saws

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As one Euclid rear-dump empties blasted rock for the bypass route along the Schuylkill River, another gets ready to dump. An Allis-Chalmers HD-20 spreads the fill.

A second shovel, a Lorain 80 with 1½-yard bucket, keeps the blasted rock moving from the cut to the Euclid 10-yard belly-dumps. This material is being used for the temporary by-pass route.

feet. Each pair of drills was powered by a 600-cfm air compressor; Glasgow used two Ingersoll-Rand Gyro-Flo compressors and one Joy compressor for the drills. Holes were loaded lightly with Atlas dynamite and detonated with up to four millisecond delays per blast on a 6×6-foot drilling pattern. The deepest rock encountered went to about 50 feet.

Six Euclid 15-yard rear dumps and three Euclid 10-yard bottom dumps handled the moving of earth and rock excavation to the fill areas. These were loaded, at various locations, by three shovels. A Lima 1201 with a 4-yard bucket, a Bucyrus-Erie 54-B with a 2½-yard bucket, and a Lorain 80 with Amsco 1½-yard bucket kept the hauling fleet constantly on the go.

Personnel

Sam Clayton is the superintendent and James Kane, the engineer, for Glasgow. Sam Stiles is the general superintendent and Jack Kubera, the job superintendent for Lippsett—the general contractor who handled the bridge work and will do the paving work on the expressway. THE END

Highway program map

LeTourneau-Westinghouse Co. announces that a 22×34-inch wall map showing the national routes in the Interstate Highway System is available free-of-charge.

Printed in four colors on heavy paper, the map also includes a chart which forecasts highway spending by states through the year 1959.

Copies of the map may be secured by writing to Highway Program Map, LeTourneau-Westinghouse Co., Dept. 085, Peoria, Ill.

B-L-H releases film

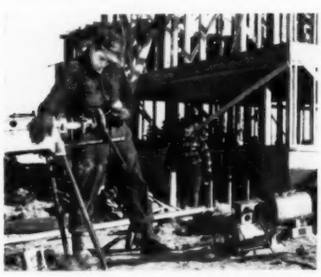
A 28-minute 16-mm sound color film, "On the Move", has been released by Baldwin-Lima-Hamilton Corp., Lima, Ohio. The film, which deals with the subject of transportation, points out the important role of shovels, cranes, and other road-building equipment. The St. Lawrence Seaway project, material handling, and general turnpike construction are covered in the film.

Copies of the film, available for clubs, associations, and engineering and student groups, may be had from Baldwin-Lima-Hamilton Corp., Advertising Department, Lima, Ohio.

Homelite Now Has Full Line of Carryable Construction Equipment

Self-Priming Centrifugal Pumps . . . Carry these lightweight, dependable pumps anywhere. Non-clogging design . . . 28 foot suction lift . . . capacities up to 15,000 g.p.h. . . . sizes from 1½" to 3". Diaphragm pump also available.

Builder's Hammer . . . Gouge, drill or chisel in any type of material — faster, easier, and at lower cost — with a Bosch (Germany) Builder's Hammer. Automatic rotary impact action for drilling. Either 110 volt AC-DC or high-cycle motor. Powerful, high-cycle rock drill also available. Both tools may be powered by a Homelite carryable generator.



Carryable Gasoline Engine-Driven Generators . . . Lightweight Homelite generators can be carried and used anywhere to provide high-cycle and 115 volt power for your electric vibrators, tools and floodlights. Complete range of sizes up to 5,000 watts . . . all standard voltages.

HOMELITE

a division of Textron Inc.

PORT CHESTER, NEW YORK

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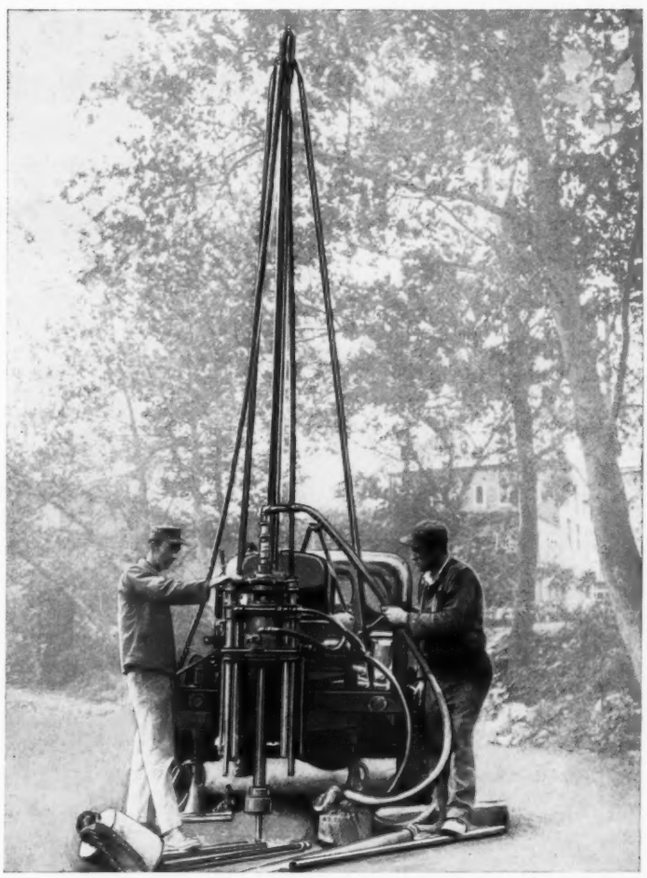

SPRAGUE & HENWOOD MAKES THE EQUIPMENT FOR THE SOIL SAMPLE OR ROCK CORE YOU WANT

With the earth-shaking increase in construction, you need efficient, versatile sampling and coring equipment.

Sprague & Henwood, Inc., a leading manufacturer of all types of equipment for foundation investigation, has just the right type for you!

Illustrated above, on location, is a truck-mounted Sprague & Henwood Model 30 Core Drill Machine. On this foundation project this machine is recovering both good samples and good cores. The soil samples have already been recovered from this boring and now the machine is being used to core rock. Because of the versatility and economy of this machine it is becoming a favorite of many contractors and other users throughout America.

The proper machine alone will not give you the good soil samples and rock cores you want. You need just the right samplers, accessory equipment and coring bits. If you need a sampler to determine only the general classification of the sub-surface soils or a sampler to secure samples for testing in a soils laboratory, Sprague & Henwood has it. There is a complete line of accessory equipment and the best in "Oriented" Diamond Bits awaiting you. One call . . . to SPRAGUE & HENWOOD, Inc., and your drilling equipment needs can be met.

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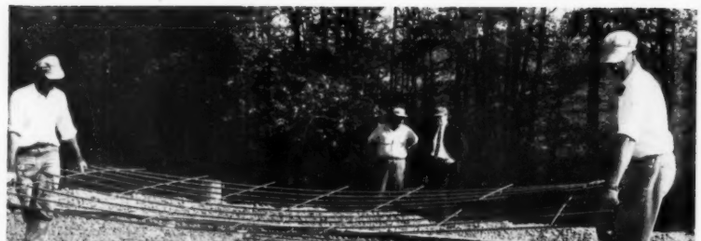
For more facts, use Request Card at page 18 and circle No. 238

The batch plant, having two Heltzel cement silos with a combined capacity of 1,000 barrels, is set up for fast one-cycle loading.



The single two-man team handles the reinforcing bar mats. Prefabrication of the mats eliminated on-the-job cutting, bending, and wiring.

No-joint concrete pavement laid in Pennsylvania

Continuously reinforced 2-mile test strip is sponsored by government and industry

With the first lift of concrete poured and the mats in places, the Ransome 34-E dual-drum paver starts its second and final run. Workmen ready bar mats for the next prime run.

Two Jaeger transverse finishers follow the Blaw-Knox butterfly-type spreader which stays close to the paver.

by ED MANNIX
assistant editor

A 10,800-foot experimental strip of continuously reinforced, jointless concrete pavement was recently laid near Hamburg, Pa. The job is a divided highway with two 24-foot-wide pavements separated by a median strip.

The installation, sponsored by the Pennsylvania Department of Highways, Lehigh University, American Iron and Steel Institute, and the U. S. Bureau of Public Roads, is part of the current realignment of U. S. 22. The experimental strip was part of a 5.27-mile section, commencing at Hamburg and ending at Lenhartsville, under contract by James Julian, Inc., of Wilmington, Del.

The test strip was divided into slab thicknesses of 7, 8, and 9 inches, as compared to the customary 10-inch thickness used in Pennsylvania.

Shallow subgrade

The subgrade, too, was a matter of special interest. Prior installations of this type of pavement—one as recently as last year on State Route 111, north of York, Pa.—called for not less than a 6-inch subgrade. On the Hamburg job, the base course was only 3 inches thick in the eastbound lanes except for three 1,000-foot sections, constructed beneath each of the 7, 8, and 9-inch thicknesses, which were 6 inches deep. In the westbound lanes, the procedure was reversed, with a 6-inch subgrade thrice interrupted with a 1,000-foot section of 3-inch depth.

Expansion and contraction in jointless pavement generally results in cracks approximately every 6 feet. However, advocates of the design assert that the cracks are so tiny in width that their existence is hardly

noticeable to the naked eye, and immaterial to the maintenance of the road. The combined width of the 16 cracks that can be found across every 100 feet of pavement is said to equal exactly the same amount of space that the slab would contract if it had a joint.

Laboratory tests have indicated that the cracks can be prevented from becoming larger than 0.025 inch by using reinforcing steel with longitudinal bars equaling 0.5 per cent of the cross-sectional area of the pavement. On the Julian job, this meant using 185 pounds of steel per 100 square feet of the 9-inch slab, 168 pounds in the 8-inch slab, and 151 pounds in the 7-inch slab.

With the exception of a 1,000-foot section of the outside, westbound traffic lane, where type K-9 welded wire fabric was used, the reinforcing steel consisted of hard-grade bar mats of $\frac{5}{8}$-inch longitudinal rods and $\frac{3}{8}$-inch transverse rods. The mats, prefabricated at Bethlehem Steel's Johnstown, Pa., plant, arrived at the job site ready for use.

The freshly poured slab, completely finished, is ready to be covered with curing paper for a 72-hour period. Only 7 inches thick, it contains no joints.

At both ends, the 10,800-foot test strip is joined to conventional 10-inch pavement by a 3-inch steel finger-joint, and rests on a sleeper slab at the base of the joint, designed to permit it to slide in the event of excessive movement.

With instrument panels installed at various points along the stretch, Lehigh University will handle the testing of the road's performance. Strain on the steel, pavement warping and movement, temperatures in the concrete, base course and subgrades, and expansion and contraction will be measured.

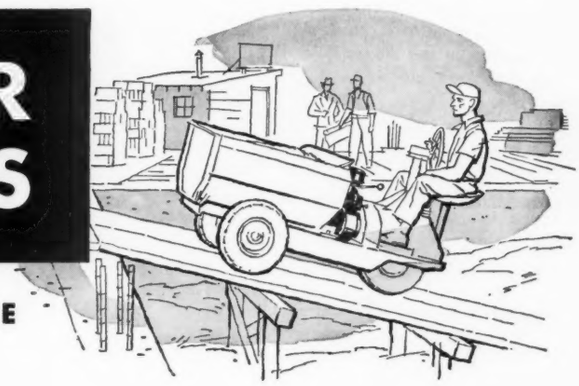
From the point of view of the Department of Highways, the new pavement, while providing a bump-free ride for the motorist, gives promise of lowered maintenance and repair costs. Cracking due to water leakage, and the chipping, spalling, and blowups resulting from an accumulation of stones and other foreign matter in joints are expected to be eliminated. Precluded too will be periodic cleaning and refilling joints.

Trenches for the forms were dug by a Cleveland Formgrader, with the base-course grading team led by a Huber 10-ton roller that compacted the crushed stone base. A Gar Wood-

(*Concluded on next page*)

The lack of expansion joints in the new slab saves much time for the hand-finishing crews that give a final touch-up to the slab after the paving train has passed.

KOHLER ENGINES



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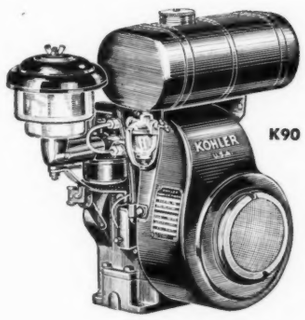

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(Continued from preceding page)

Buckeye subgrader followed.

Next came a small dump truck riding between the forms, pouring a thin layer of screening over the stone. A Huber 5-ton roller then compacted the material to finished grade. High spots detected by a hand-pulled scratchboard template were flattened with a hand roller.

Heading the paving train, and fed by 12 rented batch trucks, was a Ransome 34-E dual-drum paver, working outside the forms in laying the 12-foot lanes.

Paving with reinforcing

A Blaw-Knox butterfly-type spreader followed, striking off the wet mix for the laying-in of the reinforcement mats; the strike-off point varied, depending on the projected depth of the slab. Only two men were required to handle the mats, which were merely picked up and set end-to-end on the struck-off surface, with no wiring necessary.

The paver then made its reverse run, covering the steel mats, and bringing the slab to full depth. Two Jaeger transverse finishers and a Koehring longitudinal finisher followed. The concrete was then hand-finished, and covered with paper to cure for 72 hours.

A Heltzel batch plant with a circular, one-cycle layout was set up at one end of the 5-mile stretch. It consisted of a 3-compartment aggregate bin and two cement silos with individual capacities of 400 and 600 barrels.

A typical batch consisted of:

Stone (Type 3A)	1,278 pounds
Stone (Type 2B)	1,569 pounds
Sand	1,559 pounds
Cement	799 pounds
Water	31.4 gallons

Aggregates for the concrete were supplied by Eastern Lime Corp., Kutztown, Pa. Warner Sand Corp. at Morrisville, Pa., supplied the sand, and, the cement was furnished by Allentown Cement Co., from its plant at Evansville, Pa.

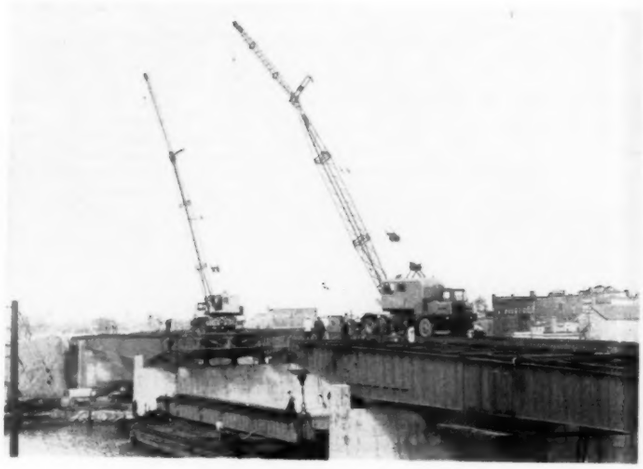
THE END

General Tire & Rubber elects O'Neil, others

Michael G. O'Neil has been elected vice president and executive assistant to the president of the General Tire & Rubber Co., Akron, Ohio. O'Neil, a member of the firm since 1946, served at the company's plant in Caracas, Venezuela, became a member of the board of directors in 1950, and up to the time of his appointment, was executive assistant to the president.

Other newly elected officers of the company are W. O'Neil, president; L. A. McQueen, C. J. Jahant, T. F. O'Neil, D. A. Kimball, C. F. O'Neil, J. E. Powers, H. M. Dodge, and J. A. Andreoli, vice presidents; T. S. Clark, treasurer; and F. W. Knowlton, secretary.

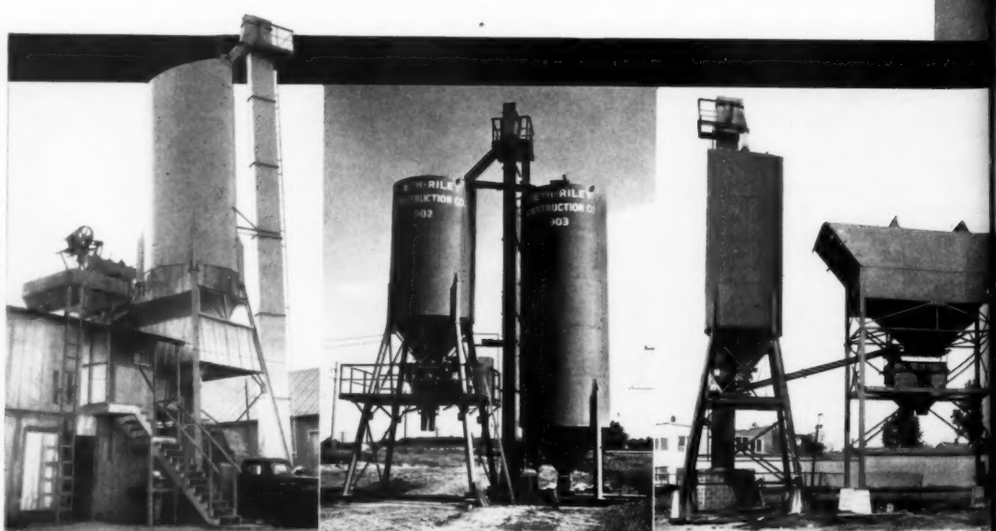
Donald W. Gladwin has been named sales representative for the firm. Gladwin will supervise the sale of vinyl tile and roll goods in four middle-Eastern states.



BOTH USING 50 FEET OF BOOM, two Lorain cranes get ready to hoist a 110-foot 30-ton girder into place for the suspended span of the River Road Bridge over the Erie Barge Canal between Tonawanda and North Tonawanda, N.Y. A total of seven of the girders was required for this portion of the structure.

Here's the Nation's Outstanding Bulk Cement Batching Plant Offer

Long known to be the best engineered plant, increased demand for the Heltzel E-3, has resulted in production economies you'll want to know more about



Standard 609 BBl. E-3 Plant provides low cost, large capacity bulk cement operation for Georgia ready mix firm.

Large Indiana highway paving contractor finds his E-3 Plant with recirculator gives him maximum portability, capacity and speed.

New Jersey ready mix operator teams the E-3 with Heltzel's rugged type 200 Aggregate Plant for fastest one-stop batching service.

133

Plants supply air-base paving with aggregate for concrete and hot-mix

Rock for the bituminous surface courses passes the Cedarapids primary jaw crusher, foreground, and goes to a screen and Cedarapids 4024, then a second screen and 4024. A last screen separates ¾-inch rock and sends it to the Pioneer surge bin to be loaded out.

Using a multi-unit crushing and screening plant, Peter Kiewit Sons' Co., Omaha, Nebr., produced aggregates for both concrete and bituminous mixes with maximum efficiency and at low cost for paving the runway, taxiways, aprons, and roads at the Minot, N. Dak., Air Force Base.

Some of the aggregates produced in the gravel pit just west of Minot required further washing and screening in special plants before they could be delivered to job stockpiles.

Completion of the $6 million in contracts for Kiewit's grading and paving operations required the production and placing of 60,000 cubic yards of portland-cement concrete in the runway, aprons, taxiways, and roads. In addition, the job called for 64,000 tons of asphaltic-concrete mixes, 38,000 cubic yards of filter gravel, and more than 300,000 cubic yards of base and subbase materials.

In the gravel pit, one series of crushing and screening units produced a number of types of aggregate. When the plant was set up to produce the two sizes of coarse aggregate for concrete, a large volume of these materials was stockpiled at the pit. The other plant units were then set up to give these aggregates the final washing and screening preparatory to delivery to the stockpiles on the job site. A similar operation was used in the production of the hot-mix aggregates.

Series of portable units

The crushing and screening plant consisted of a series of portable units including two jaw crushers, two roll crushers, and at least three screening units—all joined by belt conveyors.

In a typical setup in the pit, two Caterpillar D8 tractor-dozers pushed the gravel to a trap with a reciprocating feeder that fed the material at a uniform rate to a Kolman 42-inch conveyor. The conveyor discharged onto a grizzly that passed all minus 1½-inch material to a storage pile and sent only the larger sizes of rock on to the crushing setup.

The initial cracking of the larger sizes of stone was handled by a Cedarapids 25×40 jaw crusher fed by an apron feeder and powered by a Caterpillar D13000 engine. All the material passing this crusher was conveyed directly to a Cedarapids

Illinois paving contractor uses the Heltzel E-3 with extra large ground cement storage to provide high speed batching for modern paving operation. Note piers for addition of third 1000 BBl. recirculator.

Ohio paving contractor selected this E-3 with recirculator after comparing with several other makes. He reports the plant is most versatile, fast and exceedingly accurate.

● The Heltzel E-3 Bulk Cement Plant has long been recognized as the industry's finest engineered plant. Now, because of an increased demand, Heltzel has set up a new production facility that has resulted in economies that enable us to offer this outstanding plant at standard equipment prices.

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Select your capacity—from 250 BBls to 670 BBls—portable recirculators up to 1000 BBls each. Choose your batcher-manual, semi- or fully automatic from 16 to 60 cubic feet including the outstanding Heltzel Twin Batcher designed for high production paving operations. Plants available with "unitized construction"—factory assembled in units for even faster erection and dismantling.

Whatever your needs you will want to get all the facts on this exceptional offer before you buy. Contact your Heltzel representative—or write direct.

THE HELTZEL STEEL FORM AND IRON CO., 428 THOMAS RD., WARREN, OHIO

For more facts, use Request Card at page 18 and circle No. 240

The 1½-inch material produced by the plant is washed before use as coarse aggregate for concrete. A Kolman conveyor delivers stockpiled rock to an Eagle double log washer, and a Cedarapids 50-foot conveyor brings it to a Morok bin with a Cedarapids screen for spraying. A conveyor loads trucks with finished stone.

(Continued from preceding page)

18×36 jaw crusher that further reduced the larger sizes.

After passing over a 3×8-foot double-deck screen, the oversize went to a Cedarapids 4024 roll crusher. A 4×12-foot triple-deck screening unit and another 4024 roll crusher made up the final unit of the setup. In this final stage, minus ⅜-inch fine aggregate containing rock dust mineral filler was scalped off for use in the hot-mix plant, and the finished ¾-inch surface-course aggregate was conveyed to a Pioneer 25-ton surge bin. A 30-inch belt loader delivered the finished material from the surge bin to the trucks that hauled to the plant or to stockpiles.

In other setups, this same plant had produced 1½-inch concrete aggregate, ¾-inch concrete aggregate, 1-inch hot-mix binder-course aggregate, and other materials. Most of these were stockpiled in the pit to await washing and further screening before they were ready for use.

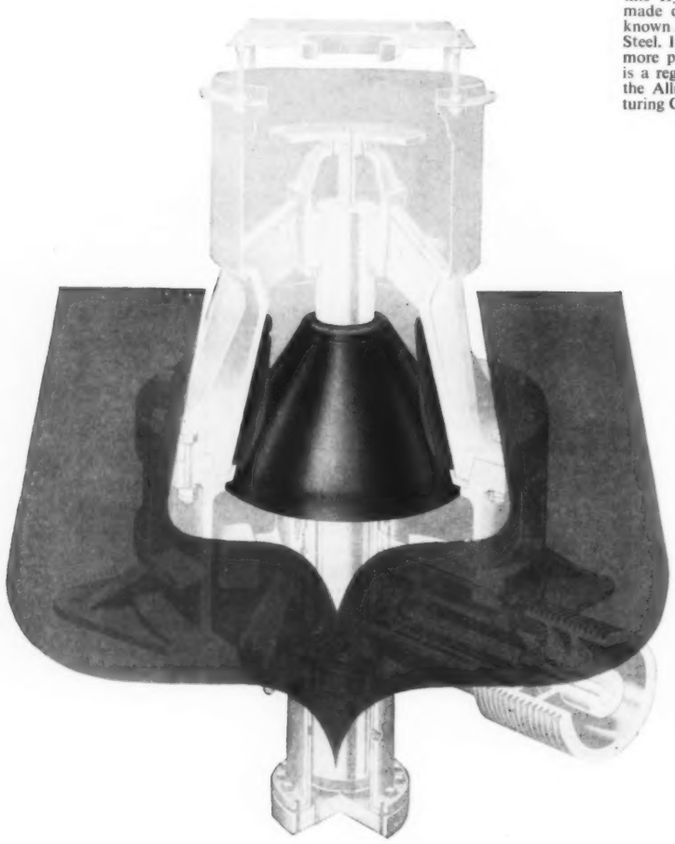
Wash concrete aggregates

A washing plant was set up adjacent to the stockpile of concrete aggregate to finish this material. A Kolman 36-inch conveyor brought the rock from the stockpile to an Eagle Model BM-D double log washer driven by an electric motor. After passing through the washer, the rock was conveyed to a Morok bin on a Cedarapids 24-inch, 50-foot-long conveyor.

The material first passed through a Cedarapids 4×12-foot triple-deck screen on top of the bin, where it was again washed with sprays. The clean finished stone went to a 25-ton storage compartment to be loaded to trucks by a 30-inch loading conveyor.

A stockpile of 1-inch aggregate for hot-mix binder course was washed in a much simpler setup to remove excess fines. Here a Caterpillar D8 fed the aggregate to a Pioneer reciprocating feeder that, in turn, fed a 24-inch conveyor terminating on a Pioneer vibrating screen. Spray bars applied water to the aggregate on the screen, washing through the excess fines as the finished material was carried over the screen to a surge bin that loaded trucks by gravity.

All of these and several other setups used to produce materials for the



Concave ring and mantle of this *Hydrocone* crusher are made of the toughest steel known . . . Amsco Manganese Steel. It *gives* a little, to take more punishment. *Hydrocone* is a registered trade-mark of the Allis-Chalmers Manufacturing Company.

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Amsco Manganese Steel Crusher Parts maintain their ductile undersurface and work-hardened surface even when worn thin. That's why Amsco parts endure severe abuse for so many work hours without letup.

To be sure of getting Amsco Manganese Steel, order replacement parts from your crusher manufacturer. Amsco makes manganese steel parts for most manufacturers of crushing, grinding and pulverizing equipment.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions

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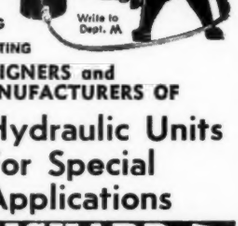

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For more facts, circle No. 242

The 1-inch aggregate produced by the plant for the asphaltic binder mix is pushed by a Cat D8 to a reciprocating feeder in a tunnel, and a Pioneer belt conveyor carries it to a Pioneer vibrating screen equipped with spray bars for washing. Trucks pick up the aggregate from the surge bin.

job showed much ingenuity in their arrangement. They were tailor made to transform the raw material in the pits into the desired finished product with maximum efficiency and economy. Yet the over-all setup was flexible enough to produce almost any desired finished product without major changes in the individual units.

Personnel

The man who supervised the gravel pit operations for Peter Kiewit Sons' Co. was Charles Powers. The project superintendent over all of Kiewit's operations at the Minot Air Force Base was Nick Evans. Lt. Col. T. W. Roe is area engineer for the Omaha District of the Corps of Engineers on the construction of the base.

THE END

Le Roi appoints Permar

Don S. Permar has been named to the newly created position of assistant general sales manager for the Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wis. Permar, who was field sales manager, will continue to be directly responsible for the operation of the field sales staff.

"My last big road job was on the Hollywood Freeway."

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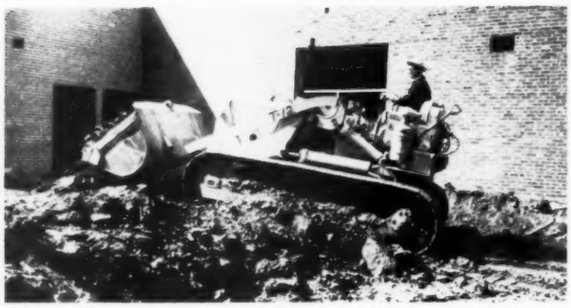
The re-usable forms being set between the precast joists consist of two end plates, shaped to the contour of the joists, and a square-end center section. Adjustable from 20 to 36 inches, they are held in place by wing nuts.



A Cat No. 6 Traxcavator move
terial out of a corner so that i
be loaded by a scraper. Thi
aided in basement excavation,
filled around completed basem
and did finished grading near
buildings.

Simple forming techniq

Though overshadowed by the sheer size of the $7 million, six-structure Eastgate Shopping Center in Indianapolis, Ind., the method of forming the stiffeners between joists supporting the first floors of the buildings stands out as one of the more unusual features of the job.

The reusable and adjustable steel forms used were designed and patented by Glen P. McGraw of Indianapolis, who was on the job supervising their use. One side of the form consisted of two plates, each shaped at one end to fit the contour of facing joists, and a center piece.

These three pieces could be adjusted easily for clear distances of 20 to 36 inches between joists. The other side of the form was of similar construction. The entire assembly was easily set in place and stripped, facilitating the work of pouring the many stiffeners between the joists.

One-year job

Using a combination of crane and bucket, transit mixer and chute, and buggies, the contractor speeded concrete placement on the huge center to

B.F.Goodrich on-the-job

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Without cost or obligation we will inspect all your tires. We'll select tires that should be repaired or replaced, point out tires that should be retreaded or recapped by factory-tested and proved B. F. Goodrich methods. We'll set up a proper inflation program.

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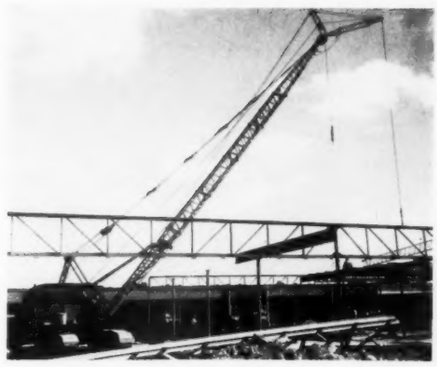
Excavation for the basement of one of the buildings is being done by an Allis-Chalmers TS-200 scraper and Allis-Chalmers HD-16 tractor-dozer.



Using a 90-foot boom and a 25-foot jib, an Insley Model WB crane sets Laclede bar joists for a building after the roof beams and trusses have been placed.

ique for floor joist stiffeners

complete the entire job within one year of the starting date.

Of the six buildings at the junction of U. S. 40 and Indiana 100 at the east edge of the city, one has a reinforced-concrete frame with a brick and stone exterior. The other five have structural steel frames with masonry curtain walls. Interiors are plastered. The largest single store is that of the H. P. Wasson Co., which has 90,000 square feet of area on its two floors. The remainder of the units have one floor and a basement. Built for the Eastgate Corp. by H. D. Tousley Co., Inc., Indianapolis, the facility had C. Wilbur Foster & Associates, Indianapolis, as architects and engineers.

Before work actually got under way, grading was done under a separate contract. Excavation for the basements was done by two Allis-Chalmers TS-200 motor scrapers with the aid of an Allis-Chalmers HD-16 tractor-dozer and a Caterpillar No. 6 Traxcavator. These same machines backfilled around the completed basement walls and did the finish grading around the buildings.

Pour basement walls

Ready-mixed concrete was used to pour the basement walls, which were formed with Symons and Universal form panels. The mix, supplied by Heston Concrete Co., Indianapolis, was chuted directly from the transit mixers to the forms when possible. Two Insley crawler cranes, one a Model WB and the other a Model L, bucketed concrete in Insley 1-yard laydown buckets to points that could not be reached by chutes. Mall electric vibrators consolidated the concrete in the forms.

With the exception of the two-story concrete frame building for the H. P. Wasson Co. store, the other structures are of single story steel frame construction above the basements. Steel columns carry the steel roof girders and stiffening trusses while Laclede and Bethlehem bar joists span between the girders to support the roof deck. All of this steel was set by the Insley WB crane, which was equipped with a 90-foot boom and 25-foot jib.

Roofing was completed with a 2-inch gypsum slab poured over a

tire service

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DEN—B. F. Goodrich Store TEmple 6-9334
ORADO—B. F. Goodrich Store UNion 3-7188
SMITH—B. F. Goodrich Store SUnset 3-4124
SPRINGS—B. F. Goodrich Store NAtional 3-6674
LE ROCK—B. F. Goodrich Store FRanklin 4-5068
VERN—B. F. Goodrich Store 409
LUFF—B. F. Goodrich Store JEfferson 4-5123

CALIFORNIA
ERSFIELD—B. F. Goodrich Store FAirview 4-4701
GARDENS—Gardner Tire Sales LUdlow 8-5165
NEY—Paramount Tire Co. LUdlow 7-5789
EKA—B. F. Goodrich Store HIllside 2-5700
MO—B. F. Goodrich Store ADams 3-5216
TINGTON PARK—Bonelli's, Inc. LUdlow 7-2241
NGELES—B. F. Goodrich Store Richmond 9-5171
STO—B. F. Goodrich Store LAmbert 2-1005
LAND—B. F. Goodrich Store HIghgate 4-2900
DING—Valley Tire Service 807
AMENTO—B. F. Goodrich Store GIlbert 2-3811
BERNARDINO—B. F. Goodrich Store 8-0947
DIEGO—B. F. Goodrich Store BEImont 2-3131
FRANCISCO—Perry & Whitelaw, Inc. UNderhill 1-1801
MUYS—Ben Rudnick STate 6-8762

COLORADO
RADO SPRINGS—B. F. Goodrich Store MEIrose 4-8861
VER—B. F. Goodrich Store KEystone 4-0175
VER—B. F. Goodrich Store PEarl 3-3739
COLLINS—B. F. Goodrich Store HUnter 2-7453
LO—B. F. Goodrich Store LIncoln 4-1663
LING—B. F. Goodrich Store LAwrence 2-0471

CONNECTICUT
FORD—B. F. Goodrich Store JAckson 7-2121
HAVEN—Peat & Voigt Service, Inc. LOcust 5106
WICH—Falcone's Servicenter TUrner 7-8051

DELAWARE
WARE—B. F. Goodrich Store 4504

DISTRICT OF COLUMBIA
SHINGTON—B. F. Goodrich Store REpublic 7-5525

FLORIDA
AUDERDALE—B.F.Goodrich Store JAckson 4-6662
SONVILLE—B. F. Goodrich Store ELgin 4-2801
LAND—B. F. Goodrich Store MUtual 2-0331
MI—B. F. Goodrich Store FRanklin 3-2113
LA—B. F. Goodrich Store MArion 2-4254
ANDO—B. F. Goodrich Store 2-3161
ACOLA—B. F. Goodrich Store HEmlock 8-3181
PA—B. F. Goodrich Store 8-0181
M BEACH—B. F. Goodrich Store TEmple 2-4181

GEORGIA
ANY—B. F. Goodrich Store HEmlock 2-6491
NTA—B. F. Goodrich Store JAckson 2-5035
STA—B. F. Goodrich Store 4-5581
MBUS—B. F. Goodrich Store FAirfax 2-3581

DALTON—B. F. Goodrich Store 2098
DECATUR—B. F. Goodrich Store DRake 7-1785
GAINESVILLE—Gainesville Tire Co. LEnox 2-2551
MACON—B. F. Goodrich Store 3-4456
ROME—B. F. Goodrich Store 2-2685
SAVANNAH—B. F. Goodrich Store ADams 6-0631

IDAHO
BOISE—Hill's 3-3421
IDAHO FALLS—Yellowstone Tire Co. JAckson 2-7513

ILLINOIS
ALTON—B. F. Goodrich Store 3-7754
AURORA—B. F. Goodrich Store 7-4848
CHICAGO—Consumers Tire & Supply Co., Inc. HAymarket 1-7513 & 1-7514
CHICAGO HTS.—B. F. Goodrich Store SKyline 5-2532
DECATUR—B. F. Goodrich Store 5258
GALESBURG—Quint's Service 4961
JACKSONVILLE—B. F. Goodrich Store CHestnut 5-6194
LA SALLE—Tom's Tire Shop 931
MOUNT VERNON—Ranmar's Standard Tire Co. 60
OAK PARK—B. F. Goodrich Store EUclid 3-4900
OLNEY—B. F. Goodrich Store 2137
PEORIA—B. F. Goodrich Store 4-4181
QUINCY—B. F. Goodrich Store BAldwin 2-4800
ROCK ISLAND—B.F.Goodrich Store 8-6374
SPRINGFIELD—B. F. Goodrich Store 3-3613
VANDALIA—B. F. Goodrich Store 638
WEST PLANO—Lucas DX Tire Service 8121

INDIANA
EVANSVILLE—B. F. Goodrich Store HArrison 5-2408
FT. WAYNE—B. F. Goodrich Store ANthony 9186
INDIANAPOLIS—B. F. Goodrich Store MElrose 5-3407
MARION—B. F. Goodrich Store 2904
MUNCIE—B. F. Goodrich Store ATlas 8-9937
RICHMOND—B. F. Goodrich Store 2-2395
VINCENNES—B. F. Goodrich Store 616

IOWA
CEDAR RAPIDS—B. F. Goodrich Store EMpire 4-5165
DAVENPORT—B. F. Goodrich Store 2-2685
DES MOINES—B. F. Goodrich Store CHerry 4-7278
WATERLOO—B. F. Goodrich Store ADams 4-4649

KANSAS
KANSAS CITY—B. F. Goodrich Store MAyfair 1-2205
WICHITA—B. F. Goodrich Store FOrest 3-1254

KENTUCKY
BOWLING GREEN—B. F. Goodrich Store Victory 2-4808
LEXINGTON—B. F. Goodrich Store 2-8877
LOUISVILLE—B. F. Goodrich Store JUniper 5-4141
MAYFIELD—B. F. Goodrich Store 54
PADUCAH—B. F. Goodrich Store 5-5454

LOUISIANA
BATON ROUGE—B. F. Goodrich Store 2-6895
MONROE—B. F. Goodrich Store 3-0386
NEW ORLEANS—B. F. Goodrich Store CAnal 0191

MAINE
LEWISTON—B. F. Goodrich Store 2-9851

MARYLAND
BALTIMORE—B. F. Goodrich Store BEImont 5-9054
HAGERSTOWN—B. F. Goodrich Store REgent 9-4760
SALISBURY—B. F. Goodrich Store Pioneer 2-2172

MASSACHUSETTS
BOSTON—Merchants Distributors, Inc. KEnmore 6-4780
BROCKTON—B. F. Goodrich Store 100
LYNN—B. F. Goodrich Store 2-0297
NEW BEDFORD—B. F. Goodrich Store 2-0275
NORTH ADAMS—B. F. Goodrich Store MOhawk3-6849
SPRINGFIELD—B. F. Goodrich Store REpublic 3-6666
W. SOMERVILLE—B. F. Goodrich Store PRospect 6-4469
WORCESTER—B. F. Goodrich Store PLeasant 5-4397

MICHIGAN
DEARBORN—B. F. Goodrich Store LUzon 1-6900
DETROIT—B. F. Goodrich Store FOrest 6-4900
FLINT—B. F. Goodrich Store CEdar 2-0169
GRAND RAPIDS—B. F. Goodrich Store GLendale 9-3444
KALAMAZOO—B. F. Goodrich Store FIrestone 3-2544
LANSING—B. F. Goodrich Store IVanhoe 2-0621
PONTIAC—B. F. Goodrich Store FEderal 2-0121
SAGINAW—B. F. Goodrich Store PLeasant 2-4101

MINNESOTA
AUSTIN—B. F. Goodrich Store HEmlock 7-3834
DULUTH—B. F. Goodrich Store RAndolph 4-8505
MINNEAPOLIS—B. F. Goodrich Store FR 5-1195
ST. PAUL—B. F. Goodrich Store CApitol 2-3617

MISSISSIPPI
COLUMBUS—B. F. Goodrich Store FAirfax 8-7150
CORINTH—B. F. Goodrich Store 6628
GREENVILLE—Bryan Wilson Tire Co. 2-1543
GREENWOOD—B. F. Goodrich Store 70
JACKSON—B. F. Goodrich Store 2-0648
MERIDIAN—B. F. Goodrich Store 2-3128
NATCHEZ—B. F. Goodrich Store 2-1651
YAZOO CITY—B. F. Goodrich Store 2164

MISSOURI
CARUTHERSVILLE—B. F. Goodrich Store 15
HANNIBAL—B. F. Goodrich Store 138
JOPLIN—B. F. Goodrich Store MAyfair 4-4141
KANSAS CITY—B. F. Goodrich Store VAlentine 2-4777
KANSAS CITY—Missouri Valley Tire Co. BAltimore 1-1184
MEXICO—B. F. Goodrich Store 3040
POPLAR BLUFF—J. A. Parker Tire Co. SUnset 5-3938
ST. CHARLES—B. F. Goodrich Store RAndolph 4-3846
ST. LOUIS—B. F. Goodrich Store FOrest 7-9300
SPRINGFIELD—B. F. Goodrich Store 4-2561

NEBRASKA
OMAHA—B. F. Goodrich Store JAckson 4024

NEW JERSEY
NEWARK—B. F. Goodrich Store MArket 3-4346
PATERSON—Dave Stern, Inc. ARmory 4-6033
PERTH AMBOY—Jersey Tire Co. VAlley 6-2300

NEW MEXICO
ALBUQUERQUE—B. F. Goodrich Store 3-5587
CARLSBAD—B. F. Goodrich Store
GALLUP—B. F. Goodrich Store UNion 3-3141
SANTE FE—B. F. Goodrich Store 3-6385

NEW YORK
ALBANY—B. F. Goodrich Store 4-8115
BRONX—B. F. Goodrich Store CYpress 5-3622
LONG ISLAND CITY—B. F. Goodrich Store AStoria 8-6566
MASSENA—B. F. Goodrich Store ROckwell 9-3541
NEW YORK—B. F. Goodrich Store ENdicott 2-0900
POUGHKEEPSIE—B. F. Goodrich Store GLobe 2-9030
SCHENECTADY—B. F. Goodrich Store DIckens 6-4282
SYRACUSE—B. F. Goodrich Store 74-5351
UTICA—B. F. Goodrich Store 3-7536

NORTH CAROLINA
ASHEVILLE—B. F. Goodrich Store 3-2726
CHARLOTTE—B. F. Goodrich Store EDison 3-4134
DURHAM—Nu-Tread Tire Co. 9-2087
FAYETTEVILLE—B. F. Goodrich Store 2-2456
GREENSBORO—B. F. Goodrich Store 2-3197
RALEIGH—B. F. Goodrich Store 3-3831

OHIO
CINCINNATI—B. F. Goodrich Store CHerry 1-4050
CLEVELAND—B. F. Goodrich Store PRospect 1-2650
ELYRIA—B. F. Goodrich Store 2552 or 2955
HAMILTON—B. F. Goodrich Store TWinbrook 3-4711
MANSFIELD—B. F. Goodrich Store 4500-B
MARIETTA—B. F. Goodrich Store FRontier 3-2096
TOLEDO—B. F. Goodrich Store CHerry 3-1258
WOOSTER—Strock's Tire Company HOward 2-6906

OKLAHOMA
MIAMI—Miami Sales Company KImball 2-2888
OKLAHOMA CITY—B.F.Goodrich Store FOrrest 5-1347
TULSA—B. F. Goodrich Store LUther 5-1221
TULSA—Tom P. McDermott, Inc. DIamond 3-9188

OREGON
EUGENE—B. F. Goodrich Store DIamond 5-6141

PORTLAND—Mel Goodin Tire Co. BEImont 5-4127
PORTLAND—B. F. Goodrich Store BEImont 6-2106
SALEM—Russell's Tire Service EMpire 2-5651

PENNSYLVANIA
CLEARFIELD—J. B. Beard 5-9644
ERIE—B. F. Goodrich Store 2-3205
HARRISBURG—B. F. Goodrich Store CEdar 4-6296
HOMETOWN—Schultz TAmaqua 2300
JOHNSTOWN—McNally Tire & Rubber Co. 5-4321
LANCASTER—B. F. Goodrich Store EXpress 2-2196
PITTSBURGH—B. F. Goodrich Store MUseum 2-8310
READING—B. F. Goodrich Store 4-2274
SCRANTON—Kelly Smertz DIamond 3-3925
TURTLE CREEK—B. F. Goodrich Store VA 3-2110
WILKES-BARRE—Economy Gas & Oil VAlley 3-0169
YORK—L. J. Allen 5728

RHODE ISLAND
PROVIDENCE—B. F. Goodrich Store DExter 1-9800

SOUTH CAROLINA
CHARLESTON—B. F. Goodrich Store 2-8391
COLUMBIA—B. F. Goodrich Store 4-6135
FLORENCE—B. F. Goodrich Store 4319
GREENVILLE—Tires, Inc. 5-9657
SPARTANBURG—B. F. Goodrich Store 5491

SOUTH DAKOTA
SIOUX FALLS—B. F. Goodrich Store 4-9979

TENNESSEE
BRISTOL—B. F. Goodrich Store 4650
CHATTANOOGA—B.F.Goodrich Store AMherst 7-1176
CLEVELAND—B. F. Goodrich Store GReenwood 6-4573
DYERSBURG—B. F. Goodrich Store ATwater 5-4820
JACKSON—B. F. Goodrich Store 7-8541
KNOXVILLE—Tinsley Tire Co. 5-0286
MEMPHIS—B. F. Goodrich Store JAckson 5-8477
MEMPHIS—Swayne Latham Tires, Inc. BRoadway 5-8121
MORRISTOWN—B. F. Goodrich Store 55
NASHVILLE—B. F. Goodrich Store ALpine 5-6353

TEXAS
BRYAN—Brazos Tire Service TAylor 3-3078
CORPUS CHRISTI—B. F. Goodrich Store TUlip 4-8841
DALLAS—B. F. Goodrich Store RIverside 1-1201
EL PASO—B. F. Goodrich Store 3-2478
FORT WORTH—B. F. Goodrich Store EDison 2-9188
HARLINGEN—B. F. Goodrich Store GArfield 3-0330
HOUSTON—B. F. Goodrich Store CApitol 7-0141
MARSHALL—Manly's 5-6776
ODESSA—Odessa Tire & Supply, Inc. FEderal 7-8378
SAN ANTONIO—B. F. Goodrich Store CApitol 7-7278

UTAH
PROVO—B. F. Goodrich Store FRanklin 3-6715
SALT LAKE CITY—Frank Ford's Transport Tire Service HUnter 5-5711
SALT LAKE CITY—B. F. Goodrich Store EMpire 4-7858
VERNAL—Superior Tire Service 445

VERMONT
BURLINGTON—B. F. Goodrich Store 2-3901

VIRGINIA
WINCHESTER—B. F. Goodrich Store MOhawk 2-0381

WASHINGTON
ABERDEEN—B. F. Goodrich Store 276
MOSES LAKE—O. K. Rubber Welders ROckwell 5-3303
SEATTLE—B. F. Goodrich Store ELliott 6666
SPOKANE—B. F. Goodrich Store MAin 5271
TACOMA—B. F. Goodrich Store MAin 9173

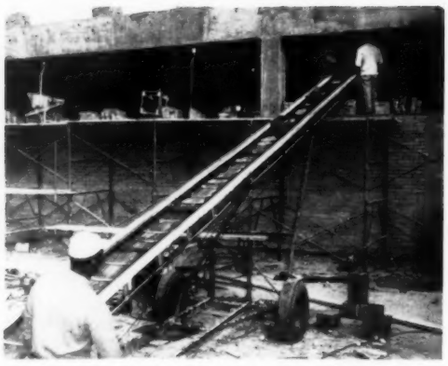
WEST VIRGINIA
CLARKSBURG—B. F. Goodrich Store MAin 4-7681
HUNTINGTON—Stettler Tire Co. 3-0197

WISCONSIN
LA CROSSE—B. F. Goodrich Store 4-4336

B.F.Goodrich
FIRST IN RUBBER

For more facts, use Request Card at page 18 and circle No. 245

The 3-inch slab floors of the buildings are supported on these precast concrete joists, which are spaced at 40-inch centers. The 2×4's being placed in wire hangers suspended from the joists will support the plywood forms for the floor slab.



Speeding the job of laying the brick walls of the buildings is this Sam Mulkey materials elevator. It takes needed materials directly to the workmen on the Safway tubular scaffold.

(*Continued from preceding page*)

Steel Bridge Floor Gives New Life to Old Bridges

When the old flooring of the three bridges shown here needed replacing, the bridges were stripped to the stringers, repairs made and new decks of Bethlehem Formed Steel Bridge Flooring laid down. Result: strong, smooth, rattle-proof bridge floors, requiring little or no maintenance.

In each case, Bethlehem Formed Steel Bridge Floor was easy to install. First, the worn planking was removed, then the Bridge Flooring was carried from the stockpile, where it nested compactly in small piles, to the bridge. After proper positioning, the 2-ft-wide corrugated steel plates were welded to the stringers, and adjacent plates welded together. In the case of wooden stringers, the steel floor is easily attached with lag screws and washers.

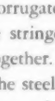
After a surfacing material was applied, the new bridge floors met all strength specifications of the American Association of State Highway Officials' standard specifications for highway bridges.

For complete information on Bethlehem Formed Steel Bridge Flooring write or phone the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

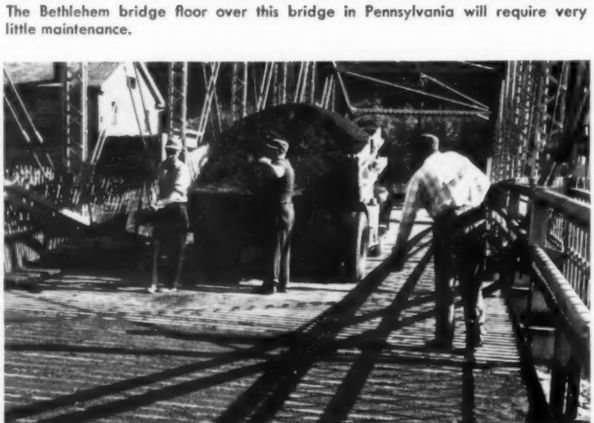
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Steel bridge floor over the solid wood stringers of this rural Tennessee span resulted in a strong bridge.

The Bethlehem bridge floor over this bridge in Pennsylvania will require very little maintenance.



Applying the first surface course on a rural Connecticut bridge. A second wearing course is also applied.

For more facts, use Request Card at page 18 and circle No. 297

1-inch fiberboard base. A steel, deck-attached canopy was covered with half an inch of insulation and then a 4-ply built-up tar and gravel roof was applied over the gypsum and canopy insulation.

The unique canopy arrangement makes it possible for a shopper to reach any store in the center without being exposed to the weather. The fascia, weighing about 3,500 pounds for each standard 20-foot length, was precast on the job by H. D. Tousley Co. It was stripped out of the steel channel forms with a double A-frame and trolley arrangement, and form oil was used as a bond breaker.

Besides the standard 20-foot length of fascia, special sections were required at the inside and outside corners with either mitered or coped ends. The canopy crossovers required 30-foot lengths, with a heavier section built up through the use of wider steel plates on the sides of the channels. The columns supported the ends of the fascia, and the steel roof deck held the fascia to line. The steel roof deck spanned from the concrete fascia to support angles attached to the peripheral trusses at the building line.

The structural steel was furnished by International Steel Co., Evansville, Ind., the gypsum slab was poured by Gypsum Constructors of Ohio, Cincinnati, and the roofing was placed by Ralph R. Reader, Indianapolis.

Precast concrete joists

Steel columns and beams subdivided the first floor area into sections with spans of 40 feet. The basement had a row of columns, making the first-floor construction a series of 20×20-foot bays. Precast-concrete joists were placed between the floor beams at 40-inch centers to support the 3-inch concrete slab. The I-shaped joists were supplied by the Cinder Block & Materials Co., Indianapolis, in 12 and 14-inch depths with 4-inch-wide flanges. They spanned up to 20 feet between the steel floor beams.

These precast concrete joists rested on the bottom flanges of the steel beams or on brackets attached to the beam webs. Thus the top surfaces of the beams and joists were at the same level.

The bridging forms were used between the concrete joists to form the

Where transit mixers and chutes were unable to reach pours, Whiteman power buggies took over. This Smith 5-yard mixer is loading one of the buggies for a basement pour.

Parking lot illumination requires a trench to be dug for the lighting conduit. Handling this job is the Blackhawk trencher attached to the rear of the Ford tractor. The rig also carries a Wagner front-end shovel.

stiffeners. The bottom form for the bridging consisted of a 2×4 under the center of the joists and perpendicular to them. It was held up against the joist by Symons adjustable shores.

The side forms consisted of adjustable three-piece steel plates. Two end plates, shaped to fit the contour of the concrete joists, overlapped the square ends of the center piece. All three pieces were held together by a small channel on the outside. Threaded studs attached to each of the three pieces were held in slotted holes in the channel by wing nuts. These form sides could be adjusted quickly for clear distances ranging from 20 to 36 inches between joists.

To place the forms, two workmen held the plates in place against the bottom form as they expanded the plates to make firm contact with the sides of the joists. They tightened the three wing nuts, and the side was in place. When the two steel sides were set, a short piece of 2×4 was placed against the lower part of each side form and a Hargrave C-type Quick Clamp was tightened over them, clamping the steel sides to the 2×4 bottom form.

The top of the bulkhead form was held in place by the floor forming. After the concrete had been placed, these bridging forms were easily removed by simply loosening the C-clamp and the wing nuts.

To support the deck form for the 3-inch concrete floor slab, 2×4 form joists were suspended from the concrete joists on wire hangers fabricated locally of No. 10 wire. A ¾-inch plywood deck completed the form.

Power buggies carry concrete

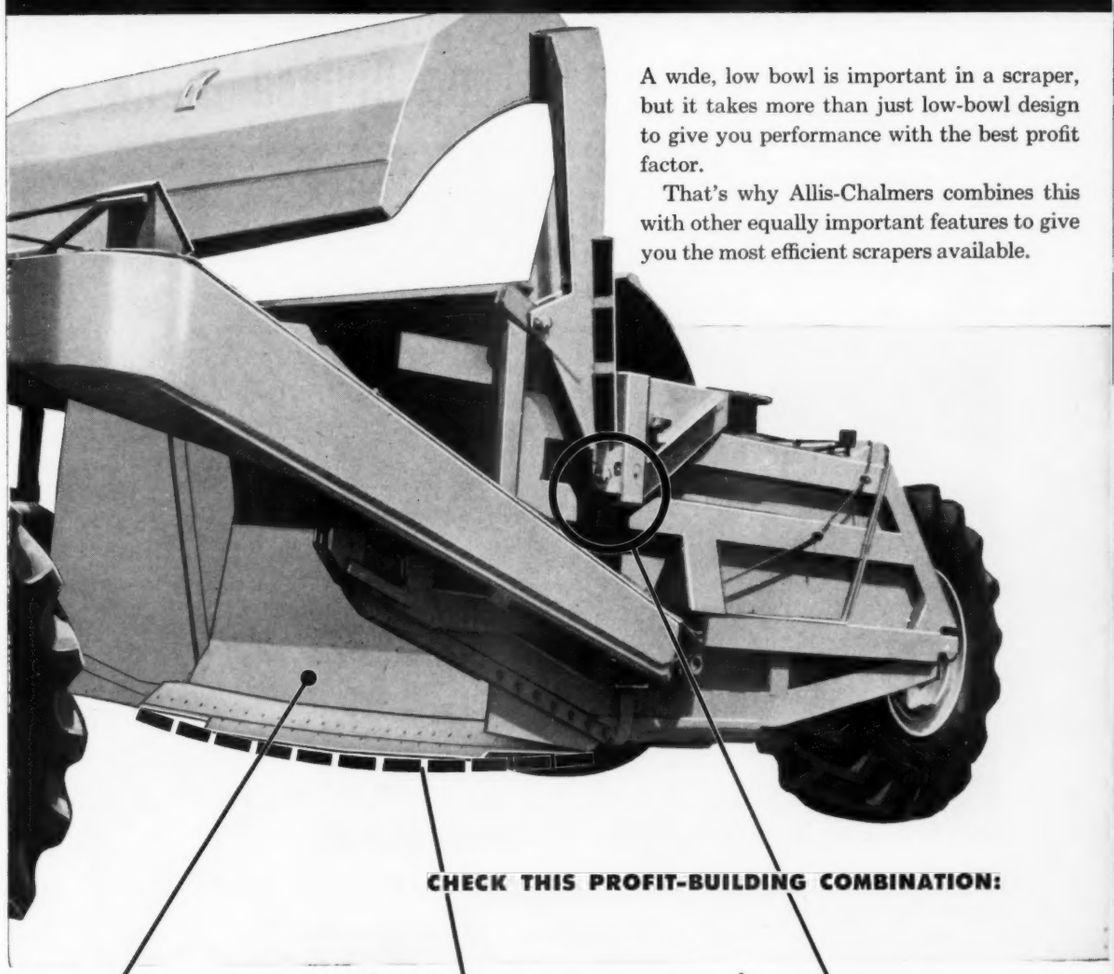
In areas which could not be reached by chutes or by crane and bucket, concrete was delivered by Whiteman power buggies. These machines were especially useful in pouring the first floor and basement floor slabs, which were placed after the building frame was in place.

In pouring basement floors, the Whiteman buggies took the concrete from the transit mixers, carried it down an earth ramp to the basement level and deposited it on the prepared base exactly where it was needed. This concrete was vibrated by a Master mechanical vibrator and finished with a Master Turn-A-Trowel and a Whiteman power finisher.

The walls of the buildings above basement level were finished with

(*Concluded on next page*)

The Low-Down on Low-Bowl Scrapers



A wide, low bowl is important in a scraper, but it takes more than just low-bowl design to give you performance with the best profit factor.

That's why Allis-Chalmers combines this with other equally important features to give you the most efficient scrapers available.

CHECK THIS PROFIT-BUILDING COMBINATION:

1. Low, wide-bowl design for fast, heaped loading.

2. Curved bowl bottom and offset cutting edge for faster, easier penetration and live, boiling loads that fill every corner of bowl.

3. Patented apron-ejector linkage combines high apron lift with positive, forward forced ejection—permits either quick, complete dump or smooth, even spreading.

Your Allis-Chalmers dealer will be glad to discuss these and many other profitable advantages with you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

For more facts, use Request Card at page 18 and circle No. 298

Grading and paving of the 3,000-car parking lot goes forward under a subcontract to Shumaker Bros., Indianapolis, Ind. The International TD-14A Drott Skid-Shovel levels a portion of the area.

The sand base for the sidewalks that will join buildings and lead to the parking lot is compacted by a Jackson vibratory compactor. The equipment is powered by a Jackson generator, foreground, driven by a Wisconsin engine.

How Would You Put a Large Drainage Line Through Soupy Soil Under a 4-Lane Divided Highway?

Although quicksand surrounds this Armco Liner Plate tunnel under the Queen Elizabeth Way, work progresses safely and efficiently inside. Note litter carrier on monorail used to remove muck.

This is an Armco Liner Plate, used to make tunnel structures.

It couldn't be done with an open trench because traffic had to be maintained. A detour was impractical. So they planned to install the drainage line by tunneling—and Armco Liner Plates got the job.

The project involved a 6-foot-diameter outfall line to be installed under the busy 4-lane Queen Elizabeth Way, an expressway running between Niagara Falls and Toronto, Ontario.

Here's how the job went. First, a shaft was sunk in the center mall of the highway. Then an 8-foot-diameter tunnel was driven in opposite directions under the two lanes. As expected, they ran into pockets of quicksand. In these areas, they used a metal shield operated by hydraulic rams to push forward through the quicksand. A sluice gate near the bottom of the shield permitted removal of the fluid sand.

In solid ground or quicksand, every time the digging advanced 18 inches, an 8-foot-diameter ring of Armco Liner Plates was bolted to the preceding ring. After the structure was completed, the drainage conduit was installed inside the Liner Plate tunnel.

* * *

Armco Liner Plates have more strength per pound than any other plates commonly used in tunneling jobs. As determined in comparative joint and compression tests, this is due to the deep corrugations and offset-lap joint of Armco Plates. For complete details, write us. Armco Drainage & Metal Products, Inc., 5237 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO LINER PLATES

For more facts, use Request Card at page 18 and circle No. 246

(Continued from preceding page)

brick and stone backed with cinder blocks. The masonry subcontractor, F. A. Wilhelm, Inc., made good use of a Sam Mulkey materials elevator to carry the masonry materials to men working on staging supported on Safway tubular scaffolding. Mortar for the masonry work was mixed in a Knickerbocker mortar mixer.

Outside sidewalks, joining the buildings and leading to the parking areas, were placed on a sand cushion compacted by a Jackson vibratory compactor powered by a Jackson generator. The concrete was placed directly from transit mixers and finished by hand methods.

Pave parking lots

A separate prime contract was awarded to Shumaker Bros, Indianapolis, for the surfacing of the 3,000-car parking lots. Using an International TD-14A tractor with a Drott Skid-Shovel and a Caterpillar No. 12 motor grader, Shumaker fine-graded the parking area. This subgrade was rolled with a steel-wheel roller, and a base of 6 inches of compacted, crushed stone was laid. The finish surfacing consisted of a 2-inch lift of plant-mixed bituminous surfacing.

Some of the other major subcontractors on the project were E. E. Schnitzius, excavating; Hatfield Electric Co., Freyn Bros. on the mechanical work; Leroy Smith & Son, the plasterer; and Ralph Iula on the painting. All are from Indianapolis.

The superintendent of the project for H. D. Tousley Co., Inc., was J. E. Sanders. The project engineer for the contractor was John Baas. The chief inspector for the supervising architects was H. Willard Walter.

THE END

Union Carbide and three divisions change names

The name of the Union Carbide & Carbon Corp., New York, N. Y., has been shortened to Union Carbide Corp. The names of three of its divisions have also been changed. Carbide & Carbon Chemicals Co. is now Union Carbide Chemicals Co.; Linde Air Products Co. becomes Linde Co.; and Carbide & Carbon Realty Co. is known as Union Carbide Realty Co.

Convention calendar

July 8–10 American Society of Landscape Architects
Fifty-eighth Annual Meeting, Sheraton-Palace Hotel, San Francisco, Calif. Prentiss French, trustee, ASLA, 305 Grant Ave., San Francisco 8, Calif.

July 8–10 School for Highway Superintendents
Conference, Cornell University, Ithaca, N. Y. Prof. J. W. Spencer, SHS, Riley-Robb Hall, Cornell University, Ithaca, N. Y.

July 14–17 National Association of County Officials
Twenty-first Annual Conference and Exhibit, Dinkler-Plaza Hotel, Atlanta, Ga. Keith L. Seegmiller, executive secretary, NACO, 1616 Eye St. N. W., Washington 6, D. C.

July 29–August 2 Prestressed Concrete Conference
International Conference, sponsored by Prestressed Concrete Institute and University of California, Fairmont Hotel, San Francisco, Calif. Department of Conferences and Special Activities, University Extension, University of California, Berkeley 4, Calif.

August 1–10 Pan-American Highway Congress
Congress, Panama City, Panama. Francisco J. Hernandez, chief of travel division department of economics and social affairs, PAHC, Organization of American States, Pan-American Union, Washington 6, D. C.

August 26–30 National Shade Tree Conference
Conference, Sheraton Hotel, Philadelphia, Pa. L. C. Chadwick, secretary-treasurer, NSTC, Department of Horticulture, Ohio State University, Columbus, Ohio.

September 3–6 New York State County Highway Superintendents Association
Summer Meeting, Concord Hotel, Kiamesha Lake, New York. Harry R. Mason, secretary, NYSCHSA, 310 De Witt Clinton Hotel, Albany, N. Y.

September 9–11 Associated General Contractors of America, Inc.
Mid-year Board Meeting, Olympic Hotel, Seattle, Wash. Wm. G. Dooly, Jr., public relations director, AGC, 1227 Munsey Bldg., Washington 4, D. C.

September 22–25 American Public Works Association
Public Works Congress and Equipment Show, Benjamin Franklin Hotel, Philadelphia, Pa. D. F. Herrick, executive director, APWA, 1313 E. 60th St., Chicago 37, Ill.

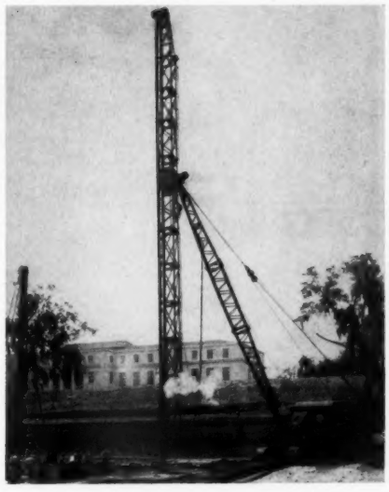
Cummins Sales opens office

A new service shop and office have been opened at Biloxi, Miss., by the Cummins Sales & Service, Inc., Fort Worth, Texas. The shop faces U. S. Highway 90 and a pier at the back of the shop leads to an adjacent boat slip which opens into the Gulf of Mexico. The office will serve truckers, boat operators, and other users of diesel engines.

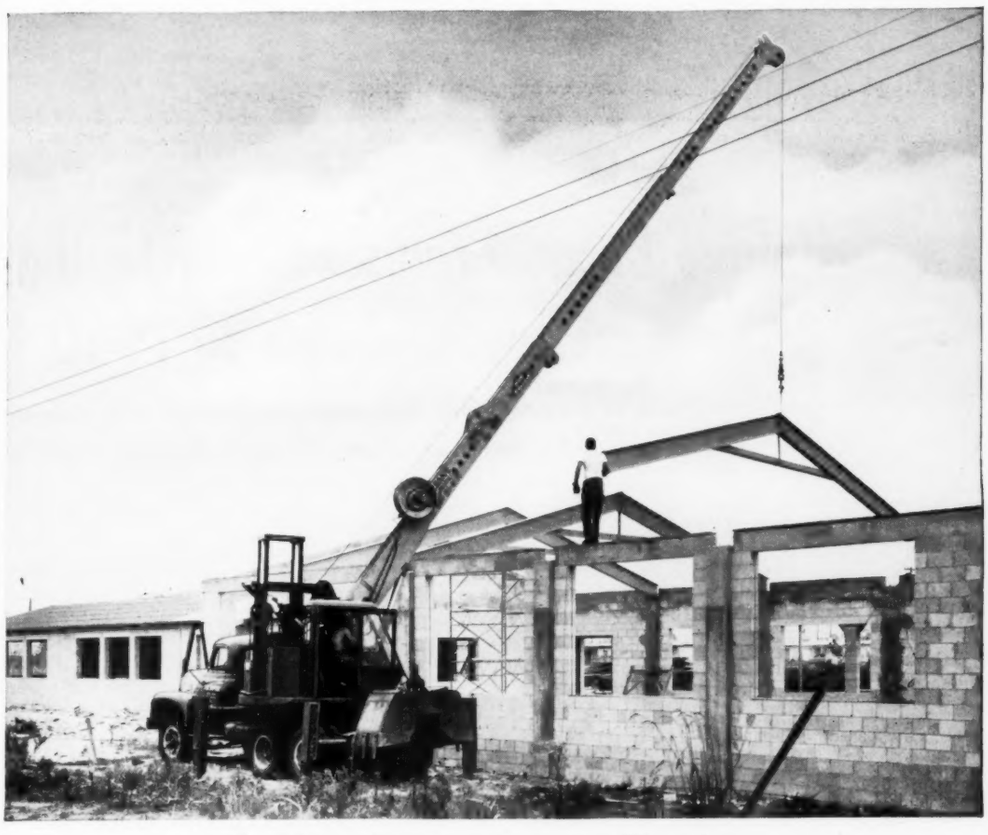
The firm also plans to open a new diesel shop and office in Wichita, Kans., to replace existing facilities there.

Safety measure for Thruway

Guide railings are being installed around piers of overhead bridges on the New York State Thruway. This is expected to cut fatalities, 38.4 per cent of which were caused this year when a vehicle struck a bridge pier.



PILE SHELLS ARE DRIVEN by the Cobi-mandrel method for the Florida State Office Building in Tallahassee. About 32,000 linear feet of Armco Hel-Cor pile shells, and 7,000 linear feet of Armco spiral welded foundation pipe were used on the job. Since the soil strata varied, some pile shells were driven only 36 feet to reach solid rock; others had to be driven more than 70 feet.



Basic Hydrocrane Design Builds Profits From MANY Angles

The basic advantages you get from the all-hydraulic Hydrocrane design eliminates hundreds of parts necessary in ordinary cranes . . . gives you a compact, lightweight machine that costs less to operate and maintain.

The Hydrocrane offers big capacity and unusual stability along with compactness, because strain and stresses of the working crane and its loads are supported by outriggers. These four steel legs extend, set and level the machine hydraulically.

With outriggers to carry the load, the Hydrocrane mounts on a conventional truck giving you the advantages of mobility, convenient corner-station servicing and standard-truck repair parts. In addition, you can save right at the start by buying a suitable, inexpensive used truck on which to mount your Hydrocrane.

Unmatched precision control lets you handle loads precisely; telescoping boom reaches out for extra jobs; working boom hoist changes boom angles while swinging . . . at the flick of a lever; and a selection of hydraulically operated attachments are money-making improvements over rope-reeved clamshells, grapples, hoes.

The Hydrocrane's basic design gives you a multi-job speedster that handles jobs ordinary cranes can't touch. Start earning extra returns on your truck-crane investment now. Get the complete profit story on the 5-ton H-3 or the 10-ton H-5 from your Bucyrus-Erie Hydrocrane distributor. 208H57

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SOUTH MILWAUKEE, WISCONSIN

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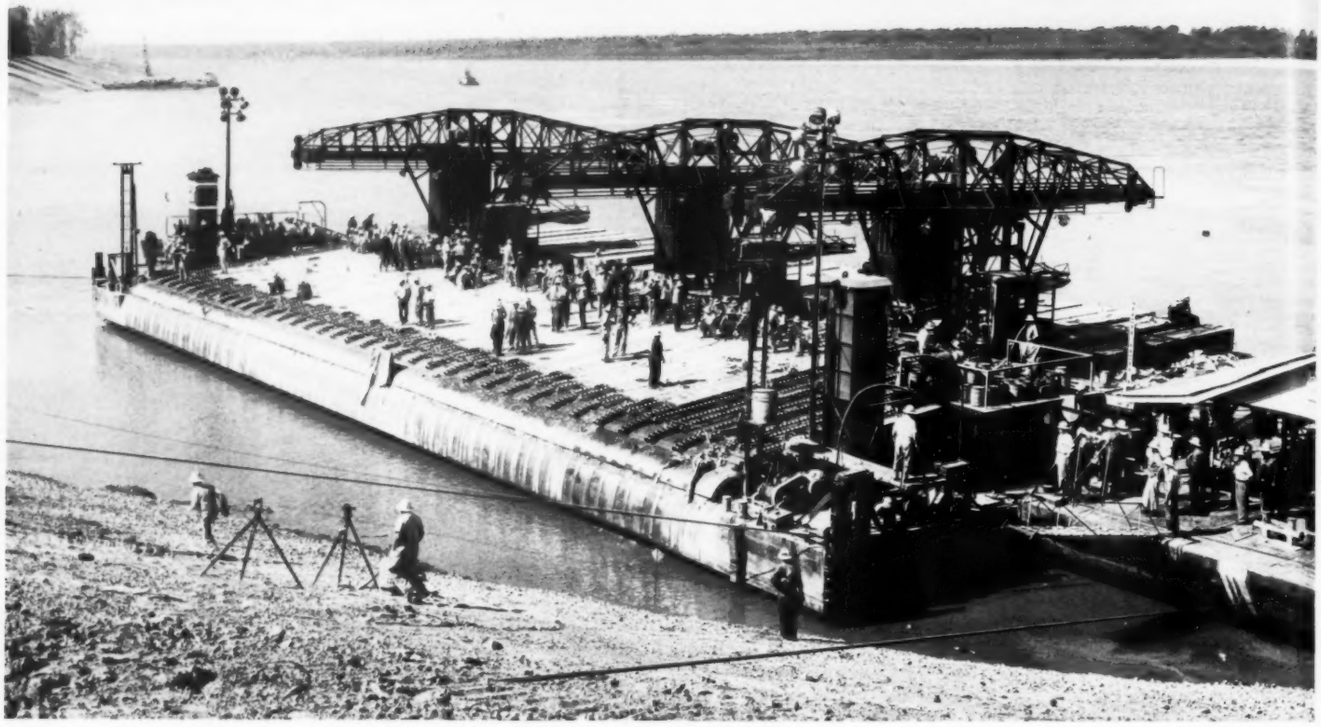


Crews ready a last mattress in a series, narrower than most, while surveyors make sure that the mat will have a 5-foot overlap on one already laid. The 4×25-foot sections are being tied together along rows of 70 rollers.

Unique barge brings cost of laying concrete revetments down to 1940 levels

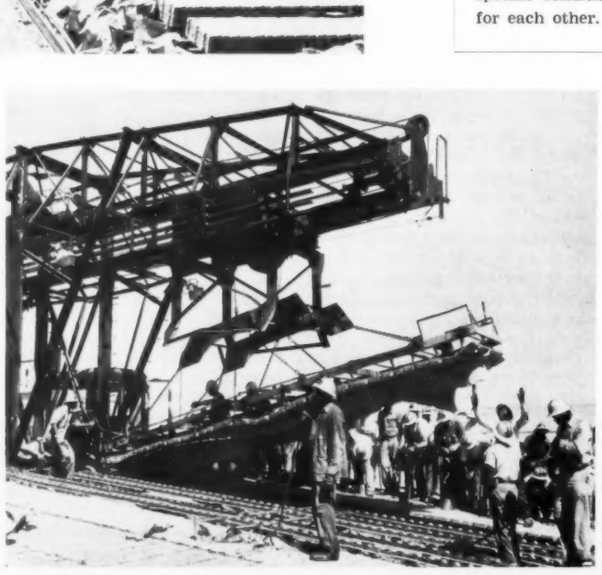
Cost of manufacturing and placing is lowered with specialized equipment; crews lay 450,000 square feet of articulated concrete mattress daily

by RALPH MONSON, field editor

Part of the continuing battle of man against nature is being wag in the lower reaches of the Mississippi Valley by two districts of t U. S. Army Corps of Engineers. Both are currently working to co the wandering tendencies of the mighty Mississippi River, wh has always risen up in floods, gouging huge chunks out of its ba and bed and depositing the material again as sandbars that men navigation.

Each of the districts has separate and different facilities building revetments to maintain and stabilize the river banks. T work of the Vicksburg District, which casts and places articula concrete mattresses, is covered here. Work on asphalt revetmen which is done by the New Orleans District, is described beginni on page 76. Both types of revetments are particularly adapted specific conditions and, whenever necessary, the districts do wo for each other.

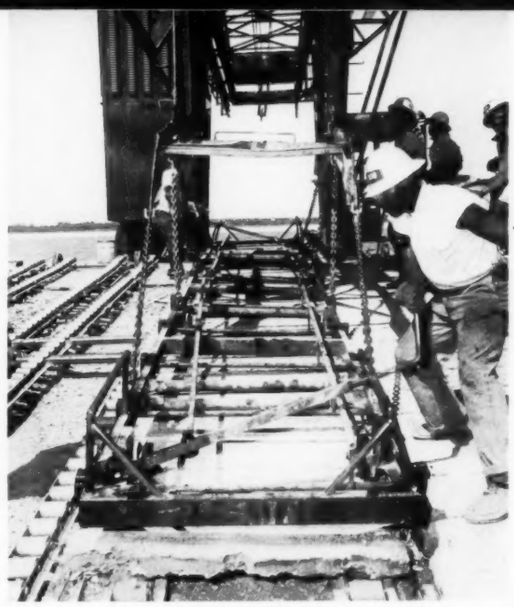
Running on rails along one side of the barge are three gantries that lift the squares of concrete mattresses from the supply barge to the mat barge. A carriage with a hoisting mechanism travels the gantry bridge and carries the multi-fingered strongbacks used to make the lifts.



The carrier of the gantry sets one of the 4×25-foot mats in place on a line of rollers on the sloping deck. The paper still clinging to the section was used to separate it from another section during the precasting operation.

Equipment designed and built specially for placing articulated concrete mattresses that will protect and control the banks of the Mississippi River is helping the Vicksburg Sinking Unit to place 450,000 square feet of the mattresses daily. A crew of 500 workmen handle the large fleet of floating equipment, which is completely self-contained so that it can operate up and down the river.

Shops, warehouses, offices, as well as living facilities for the crew make a complete floating camp whenever the fleet of 12 to 15 barges carrying these facilities ties up. In this way, the large crew is always close to the



As the gantry lowers the square of concrete mattress onto the deck of a mat barge, a workman operates a lever that disengages the fingers of the strongback holding the square. The square then drops onto the rollers and slides into place.

Men twist ties of Copperweld 3/16-inch wire around the cables extending out of the side of a square and around the ⅜-inch cable between the squares. Each square, made of 20 blocks 4 feet long, 14 inches wide, and 3 inches thick, also has three end wires for anchoring the section to the bank and the square that follows.

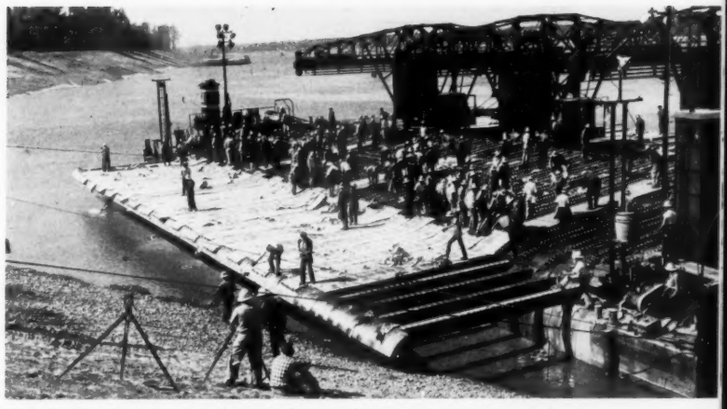
scene of the grading and sinking operations.

The articulated concrete mattresses are precast in casting yards or plants located at strategic points along the river. (See "Assembly-Line Method Speeds Casting of Concrete Mats", C&E July, 1955, pg. 22.) Some of the units are cast under contract out in the open yards; others are cast in a big semi-automatic casting plant at Greenville, Miss.

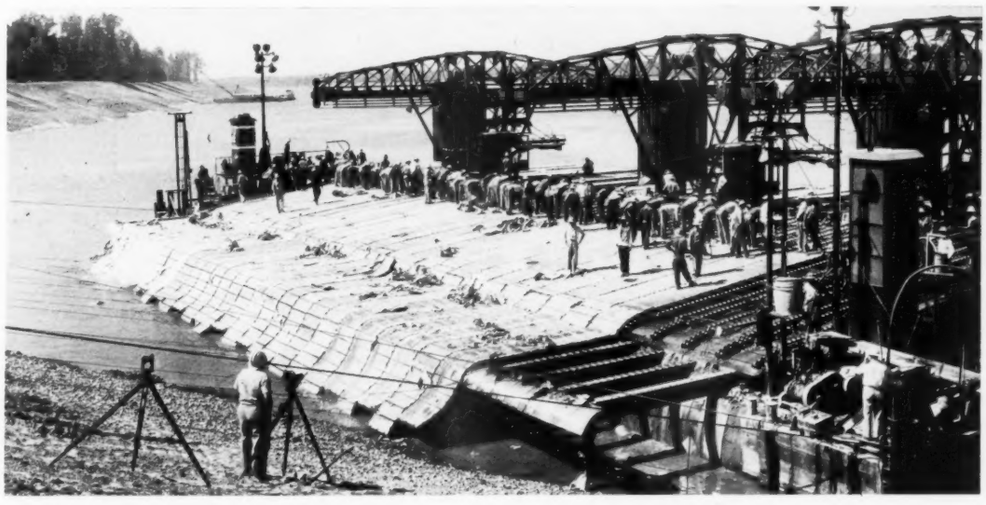
The mattresses are cast in "squares" measuring 4×25 feet. Each square is made up of 20 blocks, each 4 feet long, 14 inches wide, and 3 inches thick. The blocks, spaced ¾ inch apart, are connected with continuous rust-resistant steel wires running the 25-foot length of the square. These wires project beyond the last block in each square, forming loops so that squares can be tied together. Other wire loops, projecting out the ends of each block, are either attached to anchor cables or are used to tie adjacent squares together when the mattress is made up.

The squares, cast one on top of the other in stacks of 13, are separated by sheets of paper. All of the equipment

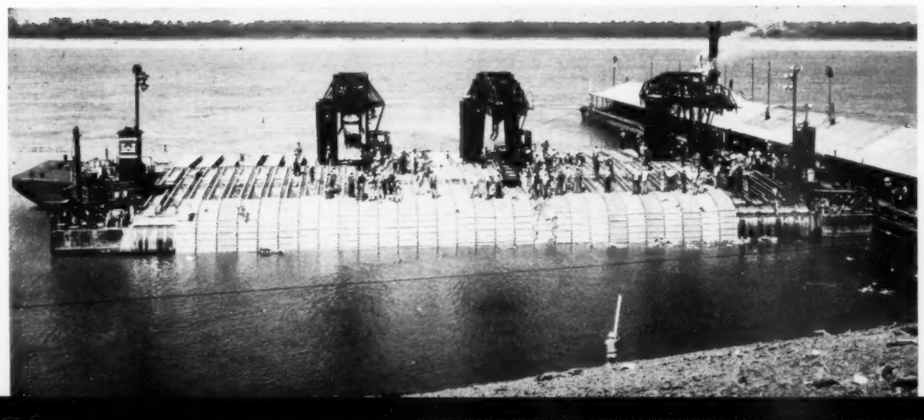
(*Continued on next page*)



When the first launching has been tied up on the deck, the mattress section is carried out beyond the edge of the deck by a set of retracting fingers. Cables running between the 4×25-foot sections extend out to be anchored on shore.



A second launching tied to the first, the fingers of the barge are retracted, starting the mattress on its way to the bottom. All equipment operating the rig—power plants, the series of launching drums, and winches that handle the spools of ⅜-inch cable tying the mattresses together—is under the deck.



As successive sections are assembled, the mat barge moves out along the anchored spar barge. The ⅜-inch high-tensile cables between each of the 4-foot-wide sections run to winches below the deck. These pay out cable as the mattress slides overboard. They also hold the cable tight as a new section is made ready.

After a snag boat has started the revetment operation by clearing an area of floating and submerged snags, a crane with 15-yard bottomless bucket grades as far from the water's edge as necessary while Cat D6 tractor-dozers dress the bank. The dozer at left has an anchor cable attached to the rear-mounted winch.

(*Continued from preceding page*)

for casting and transporting the units is designed to handle these stacks of 13 units.

The casting operation can be done at any time in advance of the placing, and the work at the casting yards is usually done during periods when river stages are unfavorable for the placing operation.

From a careful study of the river banks and bottom each year, engineers determine just where the revetments are to be placed. Then, as early in the summer as river stages reach a favorable normal level, the sinking unit sets out on its season's work.

Grading banks

Starting the field operation, a snag boat removes all floating and submerged logs, stumps, and other debris from the area designated for the revetment. At the same time, tractor-dozers are put ashore, and they begin clearing the bank area where grading operations will take place. Caterpillar D6, D7, and D8 tractor-dozers are currently being used for this operation. They are usually equipped with rear-mounted winches to assist them in operating on the steep banks.

With clearing complete and the snags removed, the dozers begin sloping the portion of the bank above water level. When feasible, the banks are graded to a 3 to 1 slope with the dozers pushing some material into low spots or eroded places, but carrying the surplus down to the water line.

Below the water line, the slope is graded on out as far as necessary to reach a stable bottom condition. This underwater grading is done by three big barge-mounted draglines using 15-cubic-yard open-bottom drag buckets. The draglines start at the water's edge, taking the surplus material left by the dozers, and carry the slope out into the river.

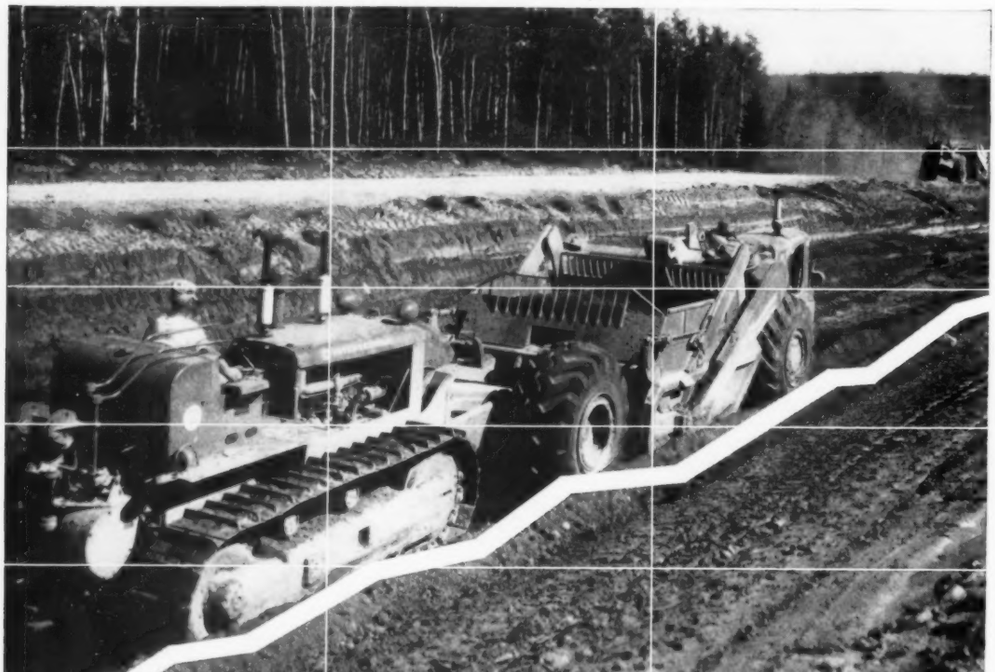
These grading crews move as much as 80,000 cubic yards of material per day in preparing the banks for the revetment.

An important part of the bank grading is the construction of lateral ditches along the top of the slopes to control overbank runoff. These ditches, usually dug by a ¾-yard dragline, lead surface water to low spots where paved ditches carry the water down the bank to river level. This important operation keeps the revetment from being undermined by surface runoff.

Unique mat boat

The heart of the sinking unit is an unusual piece of floating equipment called the mat boat. This highly specialized rig was designed and built for the U. S. Army Corps of Engineers by Avondale Shipyards, New Orleans, La.

Designed especially for the assembling and launching of the articulated concrete mattresses, this rig has increased the production of the laying unit to a point where unit costs have been brought down to 1940 levels.



Here's a torque converter equipped TD-24 pushloading an International Model 75 Payscraper for H. F. Radandt, Inc. On a comparative basis, the torque converter drive gives the TD-24 a 30% boost in production.

"Production up 30% with torque converter equipped TD-24"

says Henry L. Radandt, H. F. Radandt, Inc.

Put a tractor with mechanical drive along side a similar one equipped with a torque converter, and you'll notice one important difference right away. *The torque converter equipped machine does more work!*

Superintendent Henry L. Radandt, of H. F. Radandt, Inc., Eau Claire, Wisconsin, is typical of the many construction men who have witnessed this comparison. Mr. Radandt estimates his torque converter equipped International TD-24 Tractor "increases production by about 30% compared to a similar machine with mechanical drive."

The International TD-24 Torque Converter Crawler Tractors prove themselves on every job. The torque converter drive provides up to 6:1 torque multiplication . . . eliminating engine lugging and stalling. It permits the engine to work in its maximum efficiency range at all times . . . making available full engine output regardless of the load. It automatically and instantaneously matches output torque to load demands . . . with gear-shifting minimized or eliminated . . . for increased ease of handling and operator efficiency. It picks up heavy loads smoothly and evenly and without clutch slippage.

International Harvester Company has standardized on Twin Disc Torque Converter components for its torque converter version of the popular TD-24 Crawler Tractor. Be sure you specify a torque converter in your next TD-24. Talk it over with your International dealer today.

Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

TWIN DISC
Torque Converters

For more facts, use Request Card at page 18 and circle No. 248

Last year it cost about $26 per square (100 square feet) to manufacture and place the concrete mats.

The hull of the mat boat is a specially constructed barge 58 feet wide and 172 feet long. Along one side of its deck is a pair of rails carrying three traveling gantries. The remainder of the deck slopes away from the rails and contains 70 rows of rollers arranged so that the mattress can roll down toward the low edge of the deck.

Under the deck is the machinery that operates the rig. The basic power plants are three Caterpillar Model 375, 150-kw diesel-generators. One of these is held in reserve for emergencies. A series of launching drums and winches powered by Westinghouse 75-hp and General Electric motors handles the big spools of ⅜-inch cable that ties the mattress together and anchors it to the bank.

Each of the gantries consists of an electric-powered car with a long overhead bridge extending out over the side of the mat boat on one side and out over the deck of the boat on the other side. A carriage with a hoisting mechanism travels back and forth on the bridge. The hoist raises and lowers the multi-fingered strongback that picks up and carries the squares of concrete mattress.

One end of the mat boat is held in contact with a 360-foot-long mooring barge that extends out from the bank in the same direction the mattress is to be laid. A 360-foot-long spar barge permits the entire unit to move further out from shore when necessary. Eight Clyde double-drum steam-powered winches on the mooring barge control the lines that keep the unit under control and permit the mat boat to move out on a predetermined line.

The mooring barge also serves as a storehouse for the cable, wire, and cable clips used to fasten the mattress sections together.

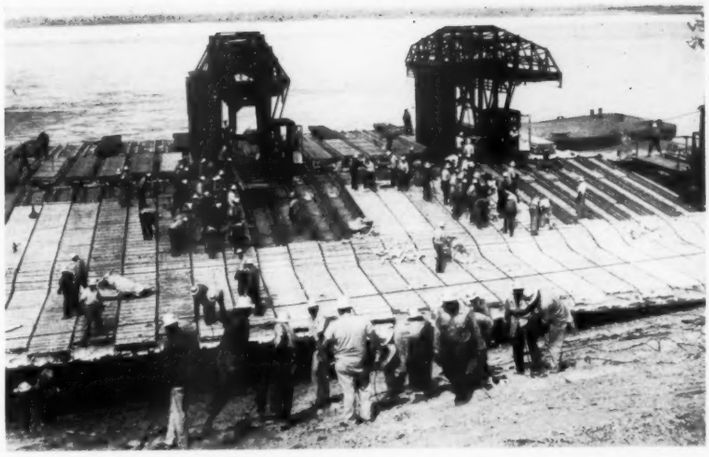
Anchor lines from the mat boat are tied down to trees or other suitable anchors ashore and are handled by two Lidgerwood double-drum electric winches mounted on the corners of the mat boat. As a mattress is launched, these anchor lines move the mat boat away from the shore.

To deliver the squares of concrete mattress from the casting yard to the mat boat, the District uses 36 supply barges. Of these, 32 are large barges measuring 195×35×10 feet. Each is capable of carrying 637 squares of mattress weighing a total of 1,080 tons. Each of the four smaller barges carries 247 squares. The steam towboat Mateur brings the loaded barges from the casting yard and returns the empties. Two tenders shuttle the barges from the job storage area to the mat boat.

Setting anchors

When the bank has been graded, a row of deadmen or anchors for the mattress are driven into the ground at 4 or 8-foot spacings and about 20 to 25 feet up from the water line.

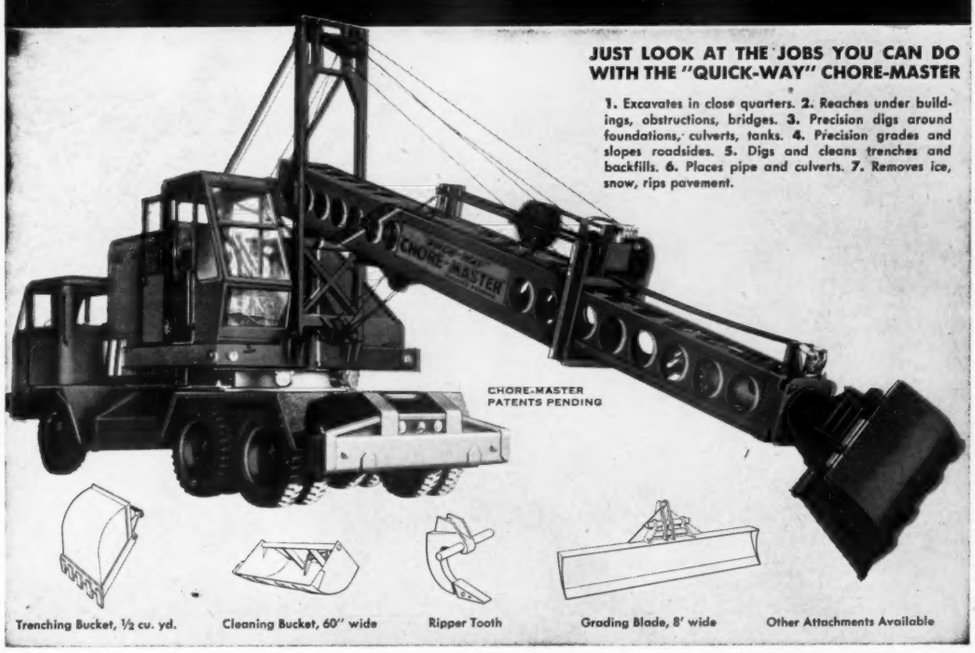
(*Continued on next page*)



When a new mattress is started, the retractable fingers of the mat boat are extended out above the water line on shore while workmen attach cables and anchors already driven into the ground. As the anchors are attached, the crew on board sets up and ties a second launching.

For the first time... an all-purpose hydraulic attachment for crane shovels!

The new "QUICK-WAY" CHORE-MASTER!



JUST LOOK AT THE JOBS YOU CAN DO WITH THE "QUICK-WAY" CHORE-MASTER

1. Excavates in close quarters. 2. Reaches under buildings, obstructions, bridges. 3. Precision digs around foundations, culverts, tanks. 4. Precision grades and slopes roadsides. 5. Digs and cleans trenches and backfills. 6. Places pipe and culverts. 7. Removes ice, snow, rips pavement.

Trenching Bucket, ½ cu. yd. | Cleaning Bucket, 60" wide | Ripper Tooth | Grading Blade, 8' wide | Other Attachments Available

The new "QUICK-WAY" Chore-Master is the first interchangeable hydraulic grading-digging attachment that makes dozens of jobs possible with one attachment. Now with the new Chore-Master, five crane shovel models, and the most complete standard line of attachments, "QUICK-WAY" is the most versatile machine you can own.

Two large hydraulic cylinders and one hydraulic motor operate the reaching, digging and swivel action of the boom and bucket. A single control lever guides all these actions with a simple twist of the wrist for sure, precision, hydraulic control.

This new attachment can be changed quickly to any of the other "QUICK-WAY" standard attachments.

Now a "QUICK-WAY" is the most versatile machine you can own—with MORE ATTACHMENTS to handle MORE JOBS with greater profits:

CHORE-MASTER • PILE DRIVER • DRAGLINE
CLAMSHELL • CRANE • MAGNET
TRENCH HOE • SHOVEL

MANY OTHER SPECIAL TOOLS ARE AVAILABLE

NOW! 5 "QUICK-WAY" MODELS WITH MORE BIG SHOVEL FEATURES:

125A—6/10 yd.—12½ Ton 105A—5/10 yd.—10½ Ton
85A—4/10 yd.—8½ Ton

85AC Crawler 105AC Crawler

"QUICK-WAY" TRUCK SHOVEL CO.
A Koehring Subsidiary Denver, Colo.

"QUICK-WAY" TRUCK SHOVEL CO. Dept. 487
2401 East 40th Ave.,
Denver 5, Colorado, U.S.A.

Please send me the following "QUICK-WAY" catalogs:

☐ Chore-Master ☐ 125A
☐ 85A ☐ 85AC Crawler
☐ 105A ☐ 105AC Crawler

Name.....
Title.....
Company.....
Address.....
City and State.....

For more facts, use coupon, or Request Card at page 18 and circle No. 249

The graded bank is made ready for the Sinking Unit. The crane is working on one of the drains that comes down through a low point in the bank. This will keep the revetment from being undermined by surface runoff. In the background are the quarters boats and other equipment of the bank protection fleet.

(*Continued from preceding page*)

Each anchor consists of an 11-inch-square piece of ⅜-inch steel plate with an 8-foot length of steel cable attached through a hole in the plate.

These anchor plates are driven vertically into the ground to a depth of 6 to 8 feet by a specially equipped rig. A Caterpillar D7 tractor, with a Chicago Pneumatic 115-cfm compressor mounted on the front end, has a 12-foot-high pair of leads attached to the rear. The tractor engine powers the compressor.

Operating in the leads is a Vulcan DGH-100 differential-acting pile hammer with a 9-foot length of 2½-inch square anchor stem attached to the under side of the hammer cap. The anchor plates fit into a fork at the end of the stem, and the stem holds them in line as they are driven.

Protruding from the back of the tractor is a boom. One cable from the double-drum winch of the tractor is carried out over a sheave at the end of the boom and attached to the anchor cable. After the hammer has driven the anchor plate vertically into the ground, the tension on the cable pulls the anchor cable into the ground at an angle. Thus, when the mattress is attached to the anchor cable, its load pulls against the full area of the anchor plate and there is little tendency to "ride up".

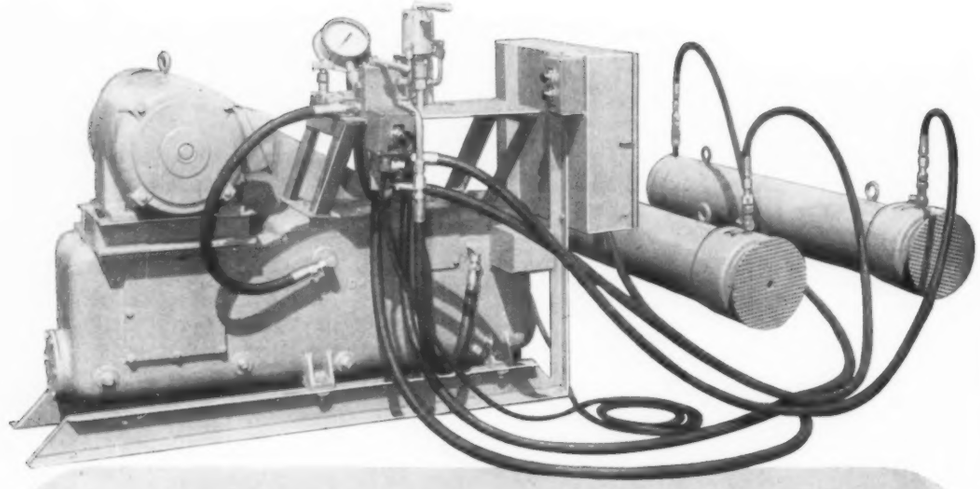
In addition to being joined by twisted wire, the wires from adjacent mats are tied to the ⅜-inch cable with cable clips. Four or five of these clips may be used per square. Each square has a total of 18 side wires and three end wires so that squares can be joined side by side and end to end.

Sinking the mattress

The exact location and size of each mattress is determined from advance surveys and plotted on a plan. In the field, the survey parties not only give the mat boat the planned location of each mattress, but they also keep a constant check on the actual location of the mattress to make certain that there is a minimum 5-foot overlap of adjacent mats.

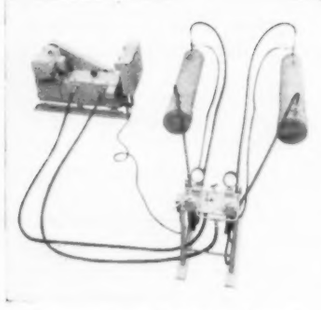
When the mooring barge has been placed on the line indicated by the survey party, the mat barge moves as close to shore as it can get. The tender brings in a loaded supply barge, and the operation is ready to start.

Each of the gantries reaches out onto the supply barge, picks up a square of mattress and places it on



Rodgers Hydraulic Prestress Units

For the best operation of your beds!



The remote control station can be converted to control any one of the other three hydraulic circuits by making a few simple changes in valving.

Now available in many models to operate one or more jacks. Control panel may be mounted directly on the pump (as shown above) or with a separate remote control panel that can be placed in any desirable position for servicing of several beds (shown at left).

You have a selection of four hydraulic circuits with positive controls for pretensioning as well as detensioning steel strands. Jacks are offered with ram travels of 30 to 48 inches and in capacities from 50 to 600 tons.

You'll find a Rodgers Hydraulic Prestress Unit just suited for your prestressed installation. Ask for Rodgers Catalog 332 or request information on any special requirements for the application of hydraulic power in your operations.

Rodgers Hydraulic Inc.

7415 Walker Street • Minneapolis 26, Minnesota

Rodgers Hydraulic jacking equipment for all purposes . . . also cylinders, pumps, control valves.

HI-PRESSURE Rodgers HYDRAULICS

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the rollers on the deck of the mat boat. Succeeding squares are placed adjacent to each other until one full row of 35 squares is in place on the deck. Cables are then strung down between the squares, and enough surplus cable is paid out to reach the anchor cables on shore.

The workmen then tie the squares together and to the cables with special Copperweld wire clips and with cable clips. On each square, 18 side wires are tied together and 4 or 5 cable clips are attached.

When this first launching of 35 squares has been tied up, a series of long fingers on the land side of the mat boat is extended out toward the bank, to carry the mattress out to a point from 1 to 3 feet up the bank from the water's edge.

While the mattress is held in this position, the workmen attach the cables to the anchors on the bank. Then, as the fingers are retracted into the mat boat, the mattress is lowered into the water.

During the time the anchor cables were being attached, the crew on the mat boat placed and tied up the second launching of squares. This process continues as the mattress is laid. As the mat boat moves away from shore, the mattress slides over the edge of the boat and settles into place on the river bottom. When the mattress has been carried out the required distance into the river, the wires are cut, and the end of the mattress settles into place on the bottom.

The mooring barge then moves far enough upstream to provide a 5-foot overlap of the next mattress, and the entire operation is repeated. Where the bank line is not straight, triangular spaces are left at points where the mooring barge changes direction. A small laying barge with a Bucyrus-Erie 54-B crane lays the required sections of mattress to cover up these pockets and reach up onto the bank.

Following the placing of the articulated concrete mattresses, the upper portion of the bank is paved with asphalt to complete the revetment. (See "Spreader Box and Tractors Pave Upper Bank of River with Sand-Asphalt Mix", pg. 72.)

Personnel

The Sinking Unit crew of 500 workmen is split in two shifts of 10 hours each for a 20-hour work day. The men usually work a 6-day week. All crew members live in the quarters boats, which are always moored nearby, wherever the Sinking Unit is at work.

The Superintendent of the Unit is John Gordon Carter, who is assisted by assistant superintendents Tom Nelson and James A. Hutcheson. Shift superintendents are A. N. Drake and Paul Kale. The chief inspector on the revetments is Richard E. Crawford. THE END

During the five-day Memorial Day holiday, the Ohio Turnpike received $292,000 in tolls. This is 56 per cent over the same weekend in 1956.

The towboat Fife brings in one of the 36 supply barges with a fresh load of squares. The 35×195×10-foot barge carries squares in stacks 13 high. There are 25 stacks on the deck; 24 stacks in the second lift bring the total weight of the load to 1,080 tons.

Symons FIELD REPORT...

Only 3 Walers Used with Symons Forms on 16′ High Wall

Henry Carlson Construction Company, Sioux Falls, South Dakota, used only 3 walers with Symons Forms on 16′ high 12″ thick wall for City Water Treatment Plant, Sioux Falls. 10,000 square feet of Symons Panels were reused 12 times on the job, resulting in considerable saving of labor, material and a fast forming schedule.

To make it easier to pour these high walls certain of the upper panels were, at regular intervals, raised 1 foot to permit pouring through side openings for the first 8 feet of concrete. This avoided dropping concrete from the top.

Send the plans for your next job and our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient and cost saving method of forming—no obligation. Symons Forms, Clamps and Shores can be rented with purchase option.

Catalogs and additional information on Forms — Clamps — Shores sent on request. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. G-7, Chicago 39, Illinois.

For more facts, use Request Card at page 18 and circle No. 251

Held back by a cable from the winch of a tractor, a Cat D7 walks down the slope with the spreader box. It will be set next to the pavement and at the top of the articulated concrete mattress that protects the underwater section of the bank.

Spreader box and tractors pave upper bank of river with sand-asphalt mix

The last step in the revetment program for the lower Mississippi region is the protection of the upper bank areas from erosion during flood control stages. Usually, this consists of a covering of about 5 inches of uncompacted asphaltic mix for the face of the bank above normal water level.

Though sometimes done by government forces, this part of the bank stabilization program is usually contracted. But whether done by a private contractor or government forces, the operations are essentially similar.

First, the bank is carefully graded from the top, or high-water level, well out into the stream. Then the articulated concrete mattresses or asphaltic block revetments are placed from normal water level out into the stream. (See "Unique Barge Brings Cost of Laying Concrete Revetments Down to 1940 Levels", pg. 66 and "Hot-Mix Paving of River Bank and River Bed Help Control Erosion", pg. 76.) This done, the exposed upper bank is paved.

Work under contract

The most recent work completed in the Vicksburg District of the U. S. Army Corps of Engineers was done under a $440,000 contract by Ford Construction Co., Dyersburg, Tenn. This firm used a barge-mounted floating asphalt plant and auxiliary equipment to produce the asphaltic mix for the job.

Sand was dug from sandbars by a crane with Erie 1¼-yard clamshell and, when sand could be obtained from sources above water level, a Cat D8 tractor-dozer pushed the sand up to the crane.

This crane loaded barges that were towed directly to the asphalt plant anchored in the river near the site of the bank-paving operation. Another crane with Erie 1¼-yard bucket clammed the sand out of the barges and charged it to the bins of the asphalt plant.

Plant operation

A single Barber-Greene 50-ton bin with a calibrated gate and reciprocating feeder supplied the sand through a bucket elevator to the two 84-inch ×20-foot oil-fired dryers, which were designed and built in Ford's Memphis shop. A single hot elevator carried the sand to the hot storage bins. From here, it was fed to the Barber-Greene continuous pugmill mixer.

Barge-delivered asphalt cement was stored and heated in a 250,000-gallon asphalt barge. Steam from an oil-

←For more facts, circle No. 252

GRADE-O-MATIC

.....a New Standard of GRADER PERFORMANCE

- No gear shift — No clutch.
- No engine lugging—No "spinning" drive wheels.
- Automatic torque multiplication as needed.
- Automatic adjustment of engine speed to load.
- Power and weight balanced to produce greatest possible "Push-Power" at the blade.

MODEL T-700 GRADE-O-MATIC, 190 h.p., 40,125 lbs.
MODEL T-600 GRADE-O-MATIC, 140 h.p., 30,420 lbs.
MODEL T-500 GRADE-O-MATIC, 125 h.p., 25,765 lbs.

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Jim— We need a grader of this type— Let's check into Galion Grade-O-Matic C.H.

THE WORLD'S LARGEST, HEAVIEST AND MOST PRODUCTIVE GRADER.

Galion is now in production on a new motor grader, designated as Model T-700, which they claim is the world's biggest, heaviest, and most productive motor grader. The model T-700 is equipped with Galion Grade-O-Matic drive which utilizes a GM-Allison torque converter and power-shift transmission to achieve ease of operation and performance on the job.

The manufacturer states that the T-700 grader was designed and built new from the ground up, and has been work-tested across the country in all kinds of weather and on all kinds of jobs. Every part of the grader is said to be larger, heavier, stronger, more efficient, and specially designed to obtain tremendous "push-power" at the blade. The total weight of the Galion T-700, with scarifier, is listed at 40,125 lbs., and it is powered by a 190 hp Cummins diesel engine.

The Grade-O-Matic drive on the Galion T-700 is reported to greatly minimize the human element in achieving top grader performance.

The torque converter multiplies the engine torque up to 340% automatically as needed. It also absorbs the load shocks and prevents engine lugging or stalling. A tail-shaft governor on the torque converter adjusts the engine speed automatically to meet all loads or conditions — at any predetermined working or travel speed. The power-shift transmission does the shifting for the operator. All he does is move the fingertip control levers — one for forward-reverse, the other for low-intermediate-high speed. Either shift can be made while moving in either direction. There are 3 speeds forward, 3 reverse, with speeds ranging from creeper to high travel speeds in either direction.

Other features listed as standard equipment on the Galion T-700 grader include a hydraulic shiftable moldboard 14 ft. long, overlay end bits, twelve-ply 16.00 x 24 low pressure tires, four-wheel hydraulic service brakes, a transmission brake for parking, and a foot decelerator for quickly reducing engine speed thus permitting immediate return to travel speed without changing the hand throttle.

For complete information on the T-700 motor grader, write The Galion Iron Works & Mfg. Co., Galion, Ohio, or any of their distributors.

O.K. - Looks like the answer to the Big Jobs coming up. Jim

Floating plant produces mix for last step in revetment program; upper bank protection follows work on hot-mix or concrete revetments

The barge-mounted Diamond crane gets ready to transfer the hot-mix from the barge being brought in by the tender Eddie J to the box spreader on the bank. The contractor's mixing plant is far out in the river.

The spreader box filled, it is pulled up the bank by a cable from the Hyster winch on the rear of a Cat D8 tractor. As each pass is made, the box deposits the 25 to 30 tons of mix to a 5-inch depth on the bank.

fired boiler heated the asphalt in storage and in the plant units.

A conveyor extending over the side of the plant barge carried the finished sand-asphalt mix to a barge moored beside the plant. Loaded and empty barges were shuttled back and forth between the plant and the placing crew by a diesel-powered tender.

To tie down the top and ends of the upper bank pavement to prevent the edges from being undermined, the contractor dug a narrow trench along these edges and filled it with the same hot-mix material used to pave the bank.

Until the introduction of the Ditch Witch, a miniature trenching machine, the preparation of the 6-inch-wide and 18-inch-deep trench had always been troublesome. Most trenching machines were too large to cut a trench this narrow and too difficult to move and maneuver. Hand digging required plenty of labor and frequently resulted in a wider ditch than was required.

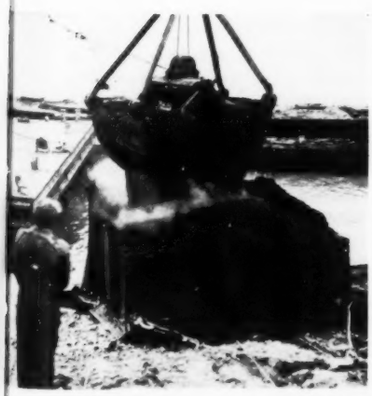
The light, easily portable Ditch Witch, made by Charles Machine Works, Perry, Okla., is a miniature, gasoline-powered bucket trencher operated by one man who walks along and guides the machine as it digs. It makes a neat 6×18-inch trench faster and better than laborers could.

As the bank was paved, the ditch was filled with hot mix that tied into the paving, providing a reinforced edge not readily undermined.

Bank paving

An open-bottom spreader box handled by Caterpillar D7 and D8 trac-

(*Concluded on next page*)



Another 2½ yards of mix is dumped from the Erie clam to the 10-foot-square open-bottom spreader box. The box will be pulled up the bank on ski-like runners by a tractor.

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Cut all day at a pace that never tires — up to 12 feet a minute. Smooth, positive traction with Clipper's exclusive abrasive-coated drive wheels, in direct contact with solid rubber tires. Never slip, never slide, even under the worst operating conditions.

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Yes . . . Clipper's SIMPLE Design . . . RUGGED construction . . . DEPENDABLE performance gives you a fast powerful Concrete Saw for heavy production cutting on all concrete and asphalt jobs. EXCLUSIVE Clipper Features include SELF-PROPELLED unit with ABRASIVE COATED DRIVE WHEELS and rear wheel drive for powerful forward thrust. POSITIVE SCREW FEED—a "MUST" when using low-cost "Green-Con" Abrasive Blades to compensate for diminishing blade diameters. Protects valuable diamond blades from bumping and scraping. A Positive Control AT ALL TIMES.

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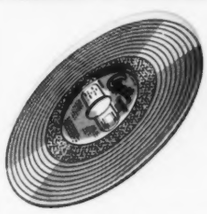

Savings as high as 80% with Clipper's New Reinforced Green-Con Abrasive Blades. A range of specifications for all types of limestone aggregates, as well as harder aggregates, when mixed with limestone. Green-Cons are available to cut 3/16" - 1/4" - and 3/8" wide joints.

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For more facts, use coupon, or Request Card at page 18 and circle No. 253

A crane with 1¼-yard Erie clamshell buckets sand from the delivery barge to the bins of the floating plant. Material coming from the Barber-Greene continuous pugmill goes up a conveyor that loads a storage barge.

(Continued from preceding page)

tors placed the mix on the graded bank. The 10-foot-square spreader box, which holds 25 to 30 tons of mix, is open both top and bottom. On the sides, it has ski-like runners that carry it on the earth bank. The lower end has an adjustable screed that permits the mix to be discharged to a uniform depth as the spreader is pulled up the bank.

A Caterpillar D7 tractor, using a special attachment on the dozer blade, started the operation by picking the spreader off the ground and carrying it down the bank. Since the bank was steep and the box heavy, a Cat D8 tractor with Hyster winch held back on the D7 bringing the spreader box down the bank.

At the bottom, the D7 set the spreader down to overlap the concrete revetment below and to be in contact with the strip of bank paving that had been laid previously. The tractor then returned to the top of the bank.

Using an Erie 2½-yard clamshell, a big barge-mounted Diamond crane bucketed the hot sand-asphalt mix from the barge to the spreader box. The D8 tractor used its winch cable to pull the box up the bank, spreading a 10-foot width of mix to a uniform depth of 5 inches. Reaching the top, the D7 picked up the box and carried it down for the start of another pass.

Occasional extreme irregularities were straightened out by workmen with hand floats, but finishing was usually required only at the joints.

While this work was being done for the Vicksburg District of the Corps of Engineers by Ford Construction Co., the New Orleans District did upper bank paving with its own equipment and forces. On the latter job, the sand-asphalt mix was made by the same plant that supplied the mix for the asphalt block revetments. The machines and techniques used in the placing operations were practically identical to those used by Ford.

Personnel

Thomas Nolan was superintendent of the bank paving operation for Ford Construction Co. C. B. Fors is president of the company and Joe Sander is manager of the paving division. The Corps of Engineers' inspector on the Ford contract was E. V. Stowers. THE END

Prestressed concrete groups hold international conference this month

Between July 29 and August 2, an international conference on prestressed concrete will be held at the Fairmont Hotel, San Francisco, Calif. Sponsored by the University of California in conjunction with the Prestressed Concrete Institute and other societies, the conference is expected to draw over 600 engineers, scientists, architects, contractors, and manufacturers from all over the world.

The purpose of the conference is to pool the knowledge and experience of men from various fields. Special sessions will discuss materials and techniques; precast prestressed concrete bridges; prestressed buildings; design, fabrication, and construction in various countries; and research on prestressed concrete. Technical films will also be presented. Commercial exhibits, panel discussions, and technical papers are scheduled.

One day will be devoted to field trips to construction jobs and visits to prestressing plants in the San Francisco Bay area.

In actual road tests . . .

Dodge won top honors in test after test between comparable models of all three low-priced trucks. Special high-speed camera records actual finish of hill-climb test. From a standing start, test crews raced all three trucks up a 32% grade. Dodge was *first* by five lengths.

and on your job . . .

Dodge gives you more V-8 power, in every weight class, than either of the other two low-priced trucks. From 204-hp. pick-ups to 232-hp. tandems, the extra power you get in a Dodge means an on-the-job performance bonus for you. It means greater economy, too, because it cuts down engine strain, reduces wear and repairs.

Dodge *Power Giants* outpower, outperform the "other two" low-priced trucks by wide margin!

Want power? Dodge outpowers its low-priced competitors by as much as 27 percent.

Want economical performance? The advanced design of the Dodge short-stroke V-8 produces the most efficient fuel usage in the industry. You get more miles per gallon . . . full power on *regular gas*.

Want extra payload capacity and handling ease? Dodge has 'em beat on both counts.

How about it? Don't you think you should find out for yourself? Just give your Dodge dealer a ring. He'll bring a truck right to your door and he'll show you certified test results that demonstrate Dodge is a winner in actual tests and on your job.

DODGE

PowerGiants

MOST POWER OF THE LOW-PRICED 3

For more facts, use Request Card at page 18 and circle No. 254

Textbook deals with basic reinforced concrete design

A textbook for civil engineering and architectural students, "Basic Reinforced Concrete Design: Elastic and Creep" by George Elwyn Large, covers the fundamentals of beam bending and shear, column, and practical continuity. Much of the material is devoted to basic treatments of creep and shrinkage, with simple office methods of application, illustrated by examples.

This second edition also includes creep and elastic stress calculations, and gives examples, based on fundamental considerations, of designing combined stress members by means of the ultimate strength method. It also presents experimental data on creep and shrinkage deformations and beam deflections, in verification of the formulas used.

A list of problems conclude each chapter. Formulas, diagrams, charts, and graphs supplement the text.

The $7 book may be purchased from the Ronald Press Co., 15 E. 26th St., New York 10, N. Y.

Engineer status reported in new NSPE handbook

A nation-wide survey report of the status of engineers employed by consulting firms has been published by the National Society of Professional Engineers. The 40-page report, "Engineers Employed by Private Practitioners", contains basic information on salaries, hours, geographic distribution of engineer employees, size of the firms, fringe benefits, length of the work week, and overtime pay practices.

The book is based on questionnaires returned by consulting firms, that range in size from those employing one engineer to those which employ 300. The questionnaires represent data for a total of 6,407 engineers. Median monthly salaries—ranging from $358 to $987.54—are based on grades, duties, responsibilities, and qualifications.

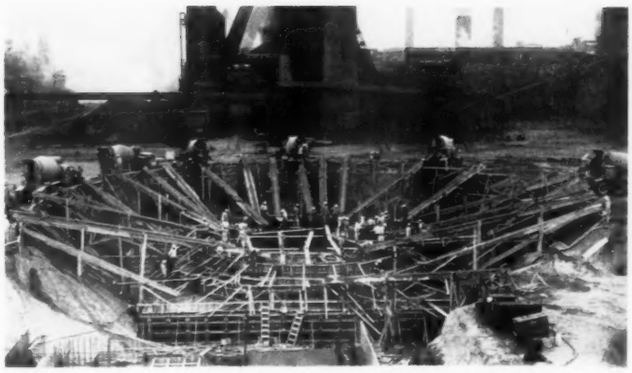
Priced at $1, the book may be purchased from the National Society of Professional Engineers, 2029 K St. N. W., Washington 6, D. C.

Hewitt-Robins film shows earthwork for railroad

A 17-minute color film, "Moving a Mountain Into a Lake", shows giant electric shovels working around the clock to tear down a 30-million-ton mountain of earth and rock to build a new 13-mile roadbed across the Great Salt Lake for the Southern Pacific railroad.

The earth and rock are transported two miles from the mountain to the lake by a Hewitt-Robins belt-conveyor system of unusual design. The film shows how the whole operation is carried out, and gives a detailed explanation of how Hewitt-Robins designed, manufactured, and erected the conveyor system.

Groups interested in seeing the film may borrow a print from Hewitt-Robins, Inc., Stamford, Conn.



Ready-mix trucks chute concrete to foundation forms for Kaiser Steel Corp.'s newest blast furnace.

Concrete foundations for Kaiser Steel plant finished in seven hours

In a continuous 2,200-cubic yard pour, the concrete foundations for Kaiser Steel Corp.'s fourth blast furnace at Fontana, Calif., were completed in seven hours and seven minutes. The firm used 49 transit mix trucks to chute concrete directly into the forms.

The steel mill, scheduled to be in operation early in 1958, is expected to double Kaiser Steel's ingot capacity from 1,536,000 tons to approximately 3 million tons per year.

Leading contractors say... K-45 KOMPACTOR most *profitable* to own

From all over the nation come new contractor reports that Buffalo-Springfield's K-45 Kompactor is *regularly* saving 50% or more over normal compaction time and costs. These records show that regardless of widely varied materials—K-45 compaction is faster, better and more efficient than was previously thought possible.

Such outstanding results come from the Kompactor's "Interrupted Pressure" principle of compaction . . . its fast speeds of 5 to 6 mph, self-propelled, in either direction . . . its high maneuverability . . . and its ability to work right up close to curbs, culverts and abutments to eliminate costly hand-tamping. These are a few of the K-45's superior performance features that *give* more to *get* more than with any other method.

Before you bid another compaction job, check on the K-45 with your nearest Buffalo-Springfield distributor. Let him show you how the K-45 does more work per day per dollar, brings you more profit. Ask him, too, for Bulletin S-67-455, or write today for complete information on this better, exclusive compaction machine. There's nothing else like it available.

Here, the K-45 Kompactor works up close—eliminates hand tamping on this California job.

The K-45 Kompactor meets density specifications in fewer passes, faster, and at less cost.

Compacting adobe on a fill, this K-45 speeds up work for another leading West Coast contractor.

BUFFALO-SPRINGFIELD ROLLER CO.
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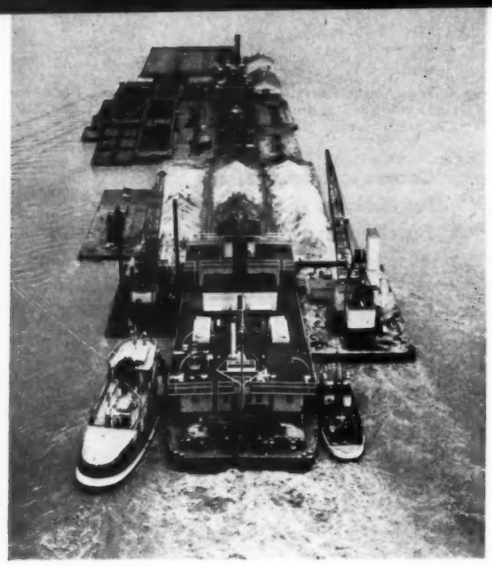
Hot-mix paving of river bank and river bed help control erosion



The towboat Attu and two smaller tugs get the compact tow of asphalt and casting plants on the move to a new location. The casting plant precasts asphaltic blocks that are placed while still warm enough to flow together on the river bottom. Sand from the river is carried on 195×35-foot barges.

It seems fantastic to pave a river bottom with asphaltic concrete, but the New Orleans District of the U. S. Army Corps of Engineers has developed a method and the equipment for doing just such a job on river banks and beds.

While the method hardly resembles the more conventional paving processes, the mixing plant and its operation are similar. The process provides a highly satisfactory revetment for the control of river bank and bottom erosion, particularly in deep water.

The big asphalt plant that produces the mix, and the block casting plant that places the underwater revetments, together with supporting equipment, are all mounted on barges. The complete spread, on 22 or more barges and a number of smaller pontoons, can be assembled into a single tow for movement up or down a river.

On a location, the plant is usually moored in some relatively quiet area, out of the way of river traffic, while placing crews range up and down stream within a range of several miles.

Mixing plant

The central unit of the asphalt plant is a 120×38-foot barge carrying hoppers, dryers, steam boilers, and the Warren Brothers mixing plant. To one end of this barge is attached a 130×30-foot barge with an Industrial Brownhoist No. 5 electric crane mounted on a 9-foot-high pedestal.

At the other end of the plant, a 195×35-foot asphalt barge stores and heats up to 1,200 tons of asphalt cement. Beyond this are more barges carrying shops, warehouses, office quarters, and the other facilities needed to maintain the operation.

Sand and pea gravel for the mix are obtained from the underwater portions of sandbars. A Bucyrus-Erie 54-B crane mounted on a spud barge digs the sand and gravel from underwater bars with an Erie 2-yard clamshell bucket. It is usually necessary to dig 9 to 12 feet under water to obtain a properly graded material. The crane loads the sand onto flat-deck 195×35-foot sand barges that are towed to the plant by one of the tenders.

Using a Williams 1-yard cleanup-type clamshell bucket, the Brownhoist crane transfers the sand and gravel

KWIK-MIX 16-S DANDIE®
handiest mixer you've ever seen

LOADS TRUCKS — Producing concrete for curbs and gutters, a Kwik-Mix 16-S Dandie mixer dumps batch directly into truck from ground level. Tower loader attachment gives 9 foot-2 inch discharge height. Big-capacity bucket holds full 17.6 cu. ft. mixer batch. It is powered by the mixer engine, dumps automatically at top of tower. Bucket travel and discharge are completed while the next batch is being

SETS UP AS CENTRAL-MIX PLANT — on bridge construction, two Kwik-Mix 16-S Dandie concrete mixers, with wheels removed, were set up side-by-side as permanent mix plants. Both were equipped with tower attachment for truck-loading operation. These big-capacity mixers also can be set up as stationary plants on elevated platforms by adding an extension track to charge the drum.

LOADS CONCRETE BUCKETS — Working on a state highway relocation project, this mobile 16-S Dandie mixed concrete for a series of box culverts — discharged batch into concrete bucket. To suit operating conditions, this versatile Kwik-Mix 16-S mixer is adaptable to side or end discharge. Axles are readily interchangeable on the square mixer frame. Change-over is easy, takes less than an hour.

KWIK-MIX COMPANY, Milwaukee 16, Wis. (Koehring Subsidiary)

Floating asphalt plant and block casting unit place revetments; precast blocks are dumped warm to flow together on river bottom

The Bucyrus-Erie 38-B clams hot-mix from the barge and fills the hoppers of cars traveling on rails over the block-casting bays. The string of pontoons keeps the casting equipment on line as it moves out into the channel.

to three elevated aggregate hoppers at the end of the plant barge. Each of the three 15-ton hoppers is equipped with feeders that feed the aggregate to chutes leading directly to the three oil-fired Ruggles-Coles dryers. The largest of these is 90 inches in diameter and 48 feet long. The other two are 70 inches×36 feet.

As the sand comes out of the river it is super-saturated. Some of this water drains out during the time the sand is being transported and the barges are waiting at the plant. But even when it reaches the site, the sand is still nearly saturated, and a great deal of drying capacity is required to keep the mixing plant supplied with material.

Two hot elevators carry the sand from the dryers to the hot bins of a Warren Brothers mixing plant. The aggregates and asphalt for the mix are weighed out on Fairbanks-Morse scales and fed into the 7,000-pound-batch pugmill mixer of the plant for the 90-second mixing cycle.

A typical batch consists of 6,630 pounds of sand and 370 pounds of asphalt cement for a total of 7,000 pounds. The asphalt content ranges between 5 and 6 per cent. The capacity of the plant is about 120 tons per hour, and since there are few causes for delay, this rate is approximately the over-all average rate of production. The plant is operated two 8-hour shifts per day, so its daily production approaches 2,000 tons.

The mixed batches are discharged into a surge bin that feeds a 30-inch-wide rayon-neoprene belt. This belt conveyor extends out over the side of the plant barge and deposits the mix in the bins of bin barges moored alongside.

Asphalt cement for the mix is delivered to the plant in a nurse barge with a capacity of 1,200 tons. A Kinney asphalt pump transfers the 85 to 100 penetration asphalt over to the asphalt barge of the plant. Like the nurse barge, this 195×35-foot asphalt barge has a capacity of 1,200 tons of asphalt.

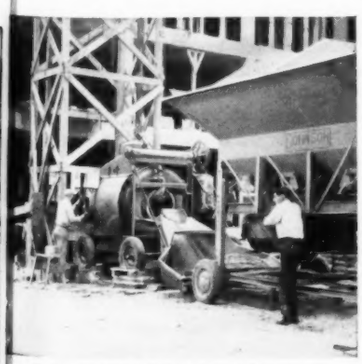
The asphalt barge is fitted with 10 square feet of heating surface for each ton of asphalt capacity. This makes it possible to get the huge load of asphalt to mixing temperature from a cold start in just 8 hours. Steam for heating the asphalt and for other uses is supplied by one large, oil-fired boiler. This boiler also supplies steam for a Westinghouse 500-kw steam turbine generator set that supplies electric power for the entire unit.

An important incidental element of the plant is the water purification system. River water with alum added is first settled in a settling tank for four hours and then run through a sand filter. Make-up water for the boilers is softened to zero hardness with an Amberlite filter. Drinking water is chlorinated. The water purification plant produces about 40 tons of water per day.

Mix stays hot in bins

The hot asphaltic mix leaves the

mixed. There's no delay to mixer production. Tower is easily attached. Top section is hinged, folds back for ample travel clearance. Tower loader attachment is also available on the 11-S Dandie concrete mixer, and on Kwik-Mix 10 and 14 cu. ft. bituminous mixers.



TEAMS UP WITH BATCHER — Concrete for a new apartment building was produced on the job by this Kwik-Mix 16-S mixer and Johnson Lo-Bin batcher — a low-cost, big-production team. (Other sizes in Kwik-Mix line include: 11-S, 6-S, 3½-S Dandie mixers.)

Also: Plaster-mortar mixers, bituminous mixers, Mote-Bugs.®

Johnson ⅜ to 3-yard Clamshell Buckets

Smooth inside and out, Johnson all-welded clamshells dig and dump with less resistance . . . give fast clean discharge. They're quick-filling, easy-closing, because big needle bearing-mounted sheaves reduce friction loss, deliver full digging power to cutting edge. Hard manganese edge, welded to heavy lips, toughens with use. 3 types, 10 sizes: ⅜ to 3 yds. Also check Johnson line of concrete plants, bins, batchers, hoppers, silos.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)

NEW 155 Trenchliner® is low and narrow

Small and compact, the working height on Parsons new 155 Trenchliner is only 7 feet-4 inches. Width over crawlers 5 feet-4 inches for work and travel in crowded areas. It digs up to 25 feet per minute — 16 to 26 inches wide, at depths to 10 feet. Has downcrowd boom, hydraulic control, "Tap-In" teeth, power-shift spoil conveyor. Available on flat shoes or grouser-type treads. Also — 6 other Parsons models, all sizes, types.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

20-ton capacity with Koehring 405 Crane

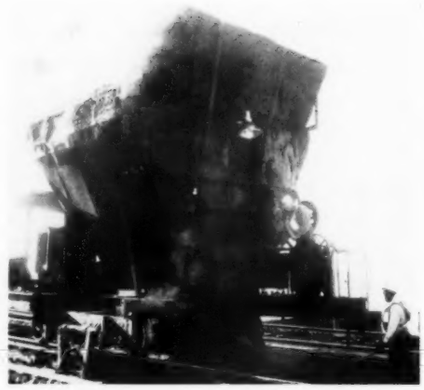
With one of these heavy-duty 405's, you're equipped to lift any load up to 20 tons. Boom lengths range from 40 to 90 feet. For added reach, 15 to 30-foot jib can be used on any length boom up to 80 ft. Extra lift-capacity and stability increases the 405's work capacity with all attachments. Converts to 1-yard shovel or hoe, handles 1 to 1½-yard clamshell or dragline buckets on wide work radius. 4 other Koehring sizes also available.

KOEHRING Company
Milwaukee 16, Wisconsin

A64

For more facts, use Request Card at page 18 and circle No. 256

Hopper cars roll down the tracks filling the 52 pans in the open-bottom wells of the casting barge. Each pan forms 16×20×5½-inch blocks. The pans tip the blocks into the river after the asphaltic mix has been cooled by river water.



The 11-ton-capacity hopper cars carry a Hercules diesel generator set on the rear platform for self-power. A shuttle car at one end of the barge, taking power from the car it carries, shifts the two hopper cars on the three sets of tracks.

(*Continued from preceding page*)

plant at a temperature of about 375 degrees F and is conveyed directly into the insulated bins of the bin barges. Each of the 120×30-foot bin barges has six separate bins, each with a capacity of 70 tons of mix. Each compartment has 4 inches of mineral wool insulation around the sides and is fitted with a cover to prevent heat loss from the top. The mix remains above 200 degrees for more than three days in these barges.

When all of the compartments of a barge have been filled, one of the tenders servicing the setup tows the loaded barge to the crews placing the mix either on the bank or below the water surface.

Wherever the work is being done, the initial operations are always the removal of snags and bank grading.

Place asphalt under water

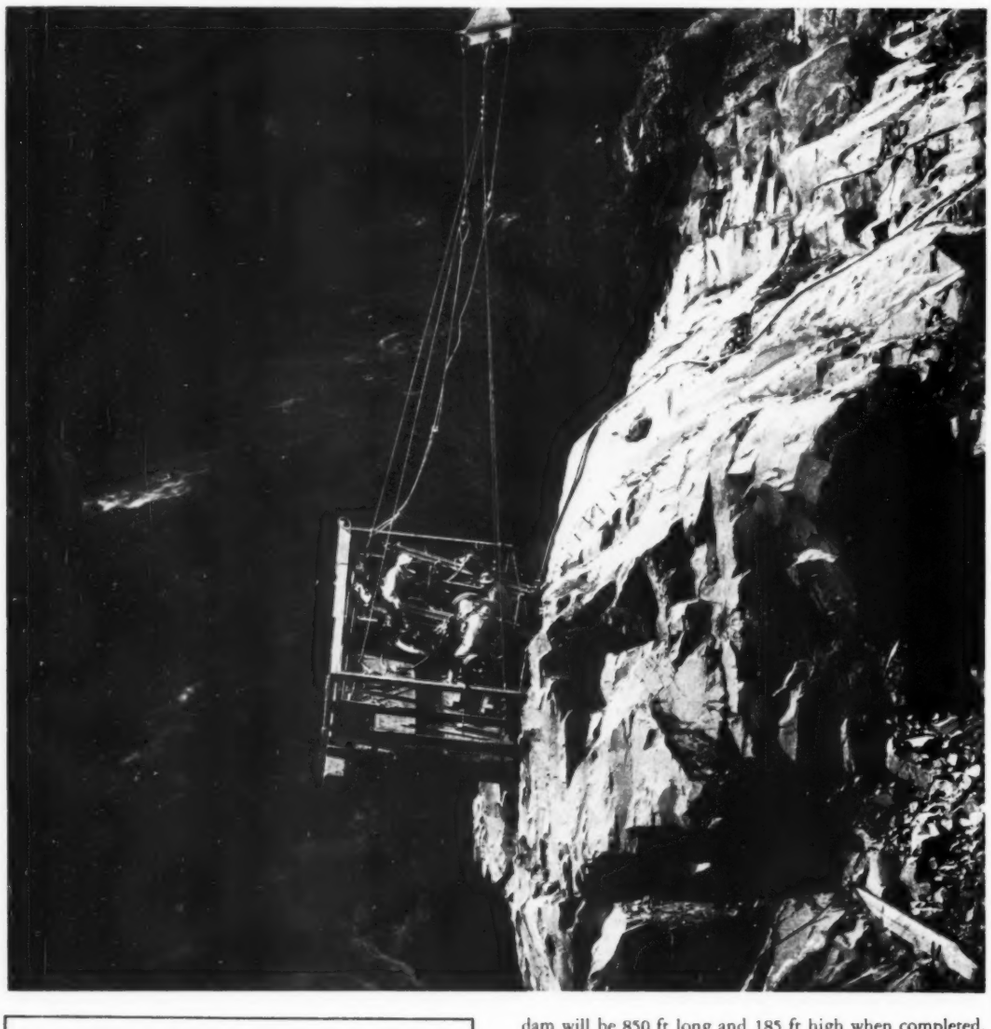
The placing of the underwater asphalt revetments is based on the principle of depositing precast blocks of asphalt mix that are still warm enough to flow and knit together into a solid mass on the bottom. This seemingly difficult task is accomplished by the block-casting plant at a high rate of speed.

The main unit of this plant is a 50×178-foot casting barge containing three long, narrow wells open at the bottom. Each contains a series of 52 pans, with each pan partitioned off to form five blocks. Each of these blocks measures 16×20×5½ inches.

Rails along the sides of the wells carry asphalt distributing cars that fill the pans with the hot asphaltic mix. Each of these cars has a hopper with a capacity of 11 tons of mix. The cars are electrically operated, and each produces its own power with a Hercules diesel-generator set mounted beside the bin.

At the start of a run, the hopper of the car is filled from one of the bin barges by a Bucyrus-Erie 38-B crane using a Blaw-Knox 1-yard clamshell bucket. The car then moves down the track under its own power. As it goes, it rights the buckets, sprays them with a coating of diesel fuel, and fills them with the bituminous mix.

A workman opens a valve, and the blocks are flooded with water, which is pumped from the river by a 10-inch centrifugal pump and distributed by headers running the length of the



WIRE ROPE AT WORK

This is a good trick if you can do it, and these four hard-rock men have it mastered. Suspended by means of wire rope above the chattering Cowlitz River, they are shown drilling bolt-holes at the site of the Mayfield Dam in southwest Washington. A project of Tacoma City Light, the dam will be 850 ft long and 185 ft high when completed.

Wire rope has numerous assignments on any big construction job, though not all of them are as spectacular as the one in the photograph. At the Mayfield Dam project, Bethlehem Purple Strand rope has seen service in many different ways; it has been one of the busiest items of equipment. And as always, Purple Strand has proved itself wholly reliable, day after day, in the heaviest, toughest kinds of lifting and hauling work.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

For more facts, use Request Card at page 18 and circle No. 257

As the car fills the pans, river water is pumped over the blocks to allow them to cool a predetermined amount. The pans are then tripped by a workman and the still warm blocks fall through open wells to settle and knit on the bottom.

Working from a 9-foot pedestal on the mixing barge, an Industrial Brownhoist No. 5 electric crane with Williams 1-yard clamshell transfers sand to the elevated bins. Sand goes by hot elevator from three dryers to the Warren Bros. plant, and a belt conveyor carries the mix to the insulated storage barge. ▼

three casting wells. In this manner the blocks are cooled to a temperature of about 120 degrees. This usually requires about 20 minutes. Cooling water for the casting pans is provided by two CMC pumps on the barge.

A workman then trips a catch, the buckets tip over, and the blocks are dumped into the water to settle to the bottom. Two dumps are usually made at the starting location. Then the barge moves 7.16 feet toward shore so that the next dump will fall on the space that was between the wells in the first location. The barge then moves out 30 feet and repeats the operation. This results in an average distribution of about 70 blocks per 100 square feet of river bottom.

While there are three wells in the casting barge, it carries only two of the cars. When a car completes the casting in one well, it rolls onto an electrically powered transfer car that carries it across the barge to the next set of rails.

At a location where a block revetment is being cast, a string of pontoons is set as a guide for the casting barge. One end of the string is anchored to shore and the other end is anchored out in the stream, with the string pointing out the direction the casting barge is to travel.

A winch barge at the end of the pontoon string handles the cables that pull the casting barge in and out along the pontoon string. On the winch barge are two Skagit double-drum winches powered by GM 4-71 diesel engines.

As with the articulated concrete mattress revetments, the upper bank above the water level must also be paved. A special crew, using the asphalt mix from the same plant, places this upper bank paving in a manner very similar to that described in "Spreader Box and Tractors Pave Upper Bank of River with Sand-Asphalt Mix", pg. 72.

The entire asphalt revetment operation, and the crew of 180 men, was under the supervision of H. L. Brownlee, Jr., during last season's operations. Jack Delamain was plant superintendent and principal assistant to Brownlee. A. O. Hale supervised the asphalt placing operations. The district engineer of the New Orleans District is Col. William H. Lewis.

THE END

Highway shoulders topic of new HRB bulletin

Highway Research Board's Bulletin 151, "A Symposium on Highway Shoulders", correlates all the material on the topic from the HRB's departments and tries to single out specifically needed research. Chapter headings include cost and benefit, design, maintenance, and the relation of the shoulders to pumping problems, pavement design, accident rate, etc.

The 75-cent book may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

how to have friends—even though blasting

There's a new, effective way to aid your public relations in communities where you are blasting. It's the interesting, informative sound film, in color, entitled, "*We're Blasting Near You.*"

When you show this film to PTA meetings, service clubs and other civic organizations, you can prove that you're a good neighbor . . . that blasting, while necessary, is nothing for people to be alarmed about.

"*We're Blasting Near You*" shows how modern millisecond delay techniques eliminate old-fashioned, jarring explosions . . . how modern methods hold blasting noise to a muffled minimum, and make vibration unnoticeable. In a friendly, noncommercial way, the movie shows your efforts to be a good citizen in the community.

You can show this movie to any age group. It is accompanied by a kit containing news releases, sample speeches, safety posters and other helpful material which will make your public relations meeting a success. Write for available dates, and show "*We're Blasting Near You*" in your community!

Technical Customer Service Section
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

For more facts, use Request Card at page 18 and circle No. 258

Repair is confined to small area to keep viaduct traffic flowing

Replacement of expansion joints, spalled concrete is done in strips one-third the roadway width

THE NEW
POWER-PACKED HEAVY-DUTY
Cardinal 1957 MASONRY SAW
with new improved Micrometric Head Height and Head Angle Adjustments
2 HP Continuous Duty Motor as Standard Equipment

NEW MICROMETRIC HEAD HEIGHT ADJUSTMENT
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100% MORE CONTINUOUS POWER
QUICK, SIMPLIFIED VOLTAGE CHANGE
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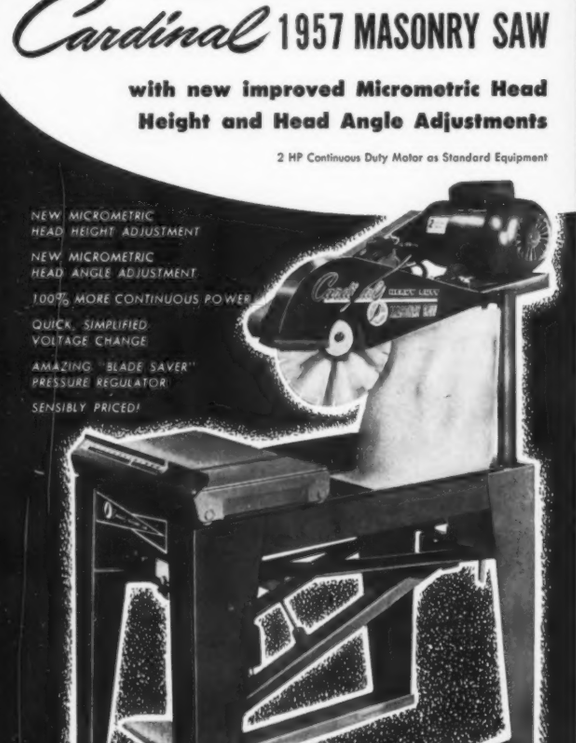
SENSIBLY PRICED!



HOW ARE YOU FIXED FOR BLADES

The power, efficiency, low initial cost and production possibilities of this amazing new Cardinal "57" MASONRY SAW surpass any masonry saw on the market today. On your next tough job . . . on hard, medium or soft materials . . . try the Cardinal "57" Saw . . . you'll get effortless performance, hour after hour—wet or dry, for top performance and maximum life from ANY make of masonry blade. Send for Bulletin MS-57 and latest price list.

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Rugged, wear resistant, factory tested, balanced and dressed for superior wet or dry cutting of ANY masonry material.

Cardinal
NEW MULTI-PURPOSE TUNGSTEN CARBIDE DIAMOND BLADES
For all types of materials—brick, tile, refractory, block, concrete. Maximum diamond concentration along edge (by our hi-retention process) assures longer cutting life.

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NON-BRAK MASONRY BLADES
Break resistant. Maximum safety on fussy wet or dry cutting jobs. Cut faster and better, last longer, cost less.

Every Cardinal Blade, Abrasive, Non-Brak, Diamond —has had the wear test for ruggedness and dependability. Send for catalog and price list.

Not a method of work, but a method of keeping the Wacker Drive viaduct open from Lake Street to Michigan Avenue in downtown Chicago was the big problem in repairing both the top and under side of the busy viaduct.

Without closing the street to traffic, Chris Paschen Corp., Chicago, had to complete the reconstruction job for the City of Chicago Department of Public Works, Division of Bridges and Viaducts. This $475,000 contract included the replacement of expansion joints, chipping away spalled concrete and replacing it with gunite, and finishing a number of other repairs to the structure, its roadway, and sidewalks.

The work was relatively simple on the under side of the deck of the two-level structure. Many areas in the reinforced-concrete portion of the viaduct were spalling or deteriorating, and deterioration was particularly bad in the concrete covering the steel structure in the vicinity of Michigan Avenue.

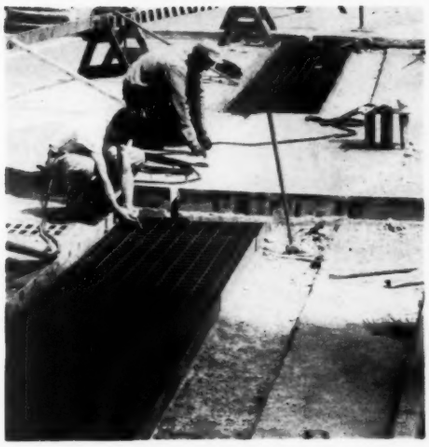
In both cases, the poor concrete was chipped away with Thor pneumatic chipping hammers powered by one of the three new Gardner-Denver 365-cfm compressors on the job. These areas were covered with 2×2-inch No. 12 welded wire fabric, which was securely anchored into the solid concrete.

These areas were built back to their original shape with pneumatically applied concrete. The mortar mix for this air-concrete, consisting of No. 2 torpedo sand, cement, and water, was mixed in a Mix-Elvator. This machine, manufactured by Air Placement Equipment Co., Kansas City, Mo., mixed the mortar and fed it from an elevated chute into the placing equipment.

To place the concrete, Paschen used an Airplaco Nucretor manufactured by Air Placement Equipment Co. and a gunite machine manufactured by Cement Gun Co. Both machines supplied the mortar to an applicating nozzle by air pressure supplied by one of the Gardner-Denver compressors. Workmen used Patent Scaffolding to reach the underside of the deck and apply the gunite. The project included 25,000 square feet of area, which was

For more facts, use Request Card at page 18 and circle No. 259

Working one-third the width of Chicago's Wacker Drive viaduct so that traffic can continue using the road, men remove the old joint plates. This done, and a new plate fastened down to the old concrete with expansion anchors. . . .



. . . a 3-inch I-Beam-Lok steel grid is attached to the new expansion plates to span the opening. The grating will be filled with concrete before a bituminous wearing surface is installed.

cleaned and patched with air-placed concrete.

New expansion joints

A great deal of the trouble on the underside of the deck was related to the old, faulty, leaky expansion joints. All these old joints were removed from the top deck and replaced with new joints.

Workmen using Gardner-Denver paving breakers first cut out a wide strip of the old asphaltic-concrete pavement down to the concrete deck of the viaduct, exposing the old expansion joints. After the old steel expansion plates were removed, the joints were cleaned. In order to maintain traffic on the busy street, the contractor had to confine the work to one third of the street width at a time. A strip along one side of the street was torn up first. After this side had been completely repaired, a strip along the opposite side was torn up and repaired. The middle section was fixed in the same manner.

New expansion plates were anchored into the concrete of the structure with expansion anchors. A section of American Bridge Co. I-Beam-Lok steel grating, 2 feet wide and 3 inches deep, was placed to span across the expansion joint. The grating was welded to the plates on one side and allowed to slide on the plates on the other side of the joint.

Concrete was mixed on the site in a Rex 6S mixer and hauled in two 14-cubic-foot Scoot-Crete buggies to fill the openings in the grating. Servicised sponge rubber and paraplastic expansion joint materials were installed at the expansion points to absorb movement without distorting the pavement.

New bituminous surfacing was then placed over the concrete to match the surface of the adjacent street. This part of the work was done by a subcontractor, Rock Road Construction Co., Chicago.

Remove ornamental brackets

One of the incidental parts of the contract which caused the contractor some concern was the removal of 60 ornamental stone brackets from the faces of the columns along the river

(Concluded on next page)

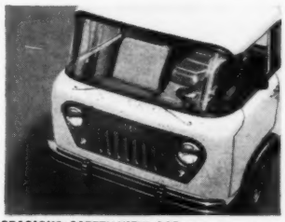
NOW

Another New and Bigger Forward Control 'Jeep' Truck

Here's the bigger, more powerful, 7,000-pound GVW Forward Control 'Jeep' FC-170 Truck:

- **Advanced Forward Control design!** The same new, advanced features that made the Forward Control 'Jeep' FC-150, an immediate success.
- **More cargo space on less wheelbase!** A 9-foot flatbed pickup box on a wheelbase only 103½-inches long! Bed is 27-inches from ground for back-saving ease of loading!
- **More efficient space utilization!** Compare it with any other 4-wheel drive truck — *only* the FC-170 gives you so much cargo space per inch of wheelbase!
- **All-time high for "big-load" maneuverability!** The FC-170 is the *only* 4-wheel drive truck to give you "go-anywhere" 'Jeep' maneuverability with a payload capacity of up to 3500-pounds.
- **Other outstanding features!** It's really a 4-wheel drive truck — *not* a modified 2-wheel drive truck, *not* a conversion! High-torque Hurricane 6-226 engine, time-tested and performance-proved • spacious Safety-View Cab • big wrap-around windshield • wide 63-inch tread for ground-gripping stability in off-road travel • shifts easily into 2-wheel drive for highway travel • with power take-off, operates a wide range of special equipment from winches to belt-driven machinery.

The newest addition to the 4-Wheel-Drive 'Jeep' family...ready for the bigger, tougher jobs!



SPACIOUS SAFETY-VIEW CAB puts you in a "Forward Control" position, gives you greater command of any driving situation.

EXTRA 4-WHEEL-DRIVE 'JEEP' TRACTION takes heavy loads to off-road areas impossible for ordinary vehicles to reach.

'Jeep' Forward Control
4-Wheel-Drive FC-170

WILLYS . . . world's largest manufacturers of 4-Wheel-Drive Vehicles

Willys Motors, Inc., Toledo 1, Ohio

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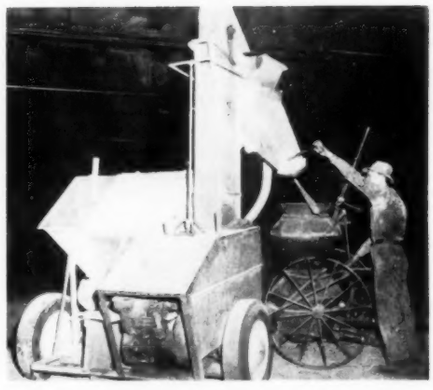
On the under side of the two-level structure, spalling and deteriorating concrete is being replaced. The gunite coating is applied to the wire mesh attached to the steel with a Cement Gun operated by a workman on a Patent scaffold.



The sand-cement grout for the gunite operation is mixed in this Mix-Elvator, which discharges grout into the upper reservoir of the Cement Gun Corp. machine.

(Continued from preceding page)

side of the structure. The stone ornaments were in three sections, the largest of which weighed about 3 tons. Some had become dangerously loose, and it was decided to remove all of them.

The two smaller pieces were wedged loose and pried out into the waiting bucket of a Hough Payloader to be deposited in a waiting truck. The larger piece had to be split in two to be removed. While the Payloader held the stone in place with its bucket, workmen split it into two pieces. The Payloader then lowered the pieces into the truck separately.

New concrete brackets were formed and cast to replace the ornamental stone brackets that had been removed.

The contract also included many repairs to sidewalks, pavement, and curbs. Sections of the old concrete and bituminous pavements were cut out with a Clipper saw and Gardner-Denver paving breaker. These areas were replaced with new concrete or bituminous material to match adjacent construction.

Personnel

The many headaches of managing this kind of a job and fighting the heavy traffic fell on the shoulders of general superintendent Edward Mertes and his assistants, Robert Sieck and George Kropp. The resident engineer for the City of Chicago was Walter Reinert. The chief bridge engineer for the Division of Bridges and Viaducts is S. J. Michuda.

THE END

Pa. highway department increases employee pay

About 1,500 engineers and engineering technicians in the Pennsylvania Department of Highways have received salary increases from $156 to $1,080 annually. This action, it is hoped, will curtail the department's loss of good engineers and technicians, and will bring back those who resigned to work for private engineering firms and other state highway departments.

The department has also announced 1,342 openings for the highway department. The majority of the positions are for highway and bridge designers, and other technical personnel.

How Viber Answers All Your Problems on Concrete Vibration

You reduce your capital investment—reduce your day-to-day operating and maintenance costs—and answer *all* your vibrating problems—by standardizing on Viber vibrating equipment.

You discover that the Viber line is the most complete line available—and that Viber internal vibrators driven by flexible shaft are the most versatile. With just 12 basic components, as shown in the photo, your men quickly and easily assemble any one of 48 shaft-driven vibrator combinations.

You use electric, pneumatic or gasoline power—whichever is most convenient for the particular job.

You have a 1¾" diameter vibrator head to assure efficient compaction in narrow forms, or where reinforcing steel is closely spaced. You also have larger, interchangeable heads (2⅛", 2½" and 3" diameter), which are recommended for maximum efficiencies in more open forms.

You have a choice of flexible drive shafts in these lengths: four, six, 12 and 21 feet. Because all shafts are immediately interchangeable with any required Viber head and motive power, you can immediately adapt to a wide range of applications in narrow to moderately open forms. Shafts can be coupled to provide longer reach.

A wide variety of other types of Viber vibrators are available to answer all your concrete vibration problems—with the lowest possible capital investment and least possible operating costs.

For factual information, illustrated literature and the name of your nearest distributor, write Viber Company, 726 South Flower St., Burbank 21, California.

VIBER CO. VIBRATORS

Pioneers and leaders in the manufacture of vibrators.

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FAST, LOW-COST WAY TO INSTALL PIPE . . .

push it under streets, roads, tracks, lawns with a timesaving

GREENLEE HYDRAULIC PUSHER

Speed underground piping jobs this way. GREENLEE Pusher is one-man-operated (by hand or with power pump), portable, simple to set up and use. No tearing up of pavement, floors, lawns . . . does away with extensive ditching, tunneling, backfilling, repaving. GREENLEE Pusher cuts job time to a fraction . . . often pays for itself on first job.

Two feet per minute average pushing time

GREENLEE Pushers are available in two sizes. No. 790 for ¾" to 4" pipe . . . No. 795 for pipe over 4", concrete sewer pipe, large ducts. Average performance of No. 790, shown above with power pump, two feet per minute. Write for literature.

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For more facts, circle No. 262

Highway curves, test track design topic of HRB text

Highway Research Board Bulletin 149, "Highway Curves and Test Track Design", contains two reports, the first of which describes the principles of test tracks designed for automotive proving ground operation. These tracks, designed to permit testing vehicles over wide ranges of speeds and many conditions of operations, have a higher rate of superelevation on high-degree curves. The paper also details the design and layout of horizontal transition spirals, and vertical curves for spiral easements.

The second paper describes and analyzes human sensitivity to motion as a proper criterion in the design of highway curves. Applications of these evaluations in the design of vertical and horizontal highway curves and transitions are developed and demonstrated by examples taken from automotive proving grounds.

The $1 book may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Film features concrete handling methods

A 17-minute motion picture featuring job proven methods for handling concrete products with modern mechanical equipment has been produced by Hyster Co., Portland, Oreg. The film covers handling concrete block, pipe, and precast products from the raw material stage to storage and delivery of the finished product.

Sequences show the detailed steps in the handling techniques developed by concrete plants to reduce handling costs and breakage, and increase production. The film emphasizes the important use of attachments which permit lift trucks to perform a variety of jobs.

The film, which can be used for private or group showings, is available on a free-loan basis from the Hyster Co., 2902 N. E. Clackamas St., Portland, Oreg.

Cummer & Son moves office and warehouse to new site

F. D. Cummer & Son Co., Cleveland, Ohio, has moved its general offices and warehouse to new quarters at 2110 E. 21st St., Cleveland. The warehouse will provide repair and replacement parts for asphalt plants in the United States.

The firm's new engineering department will work with customers requiring conventional semi-portable and stationary asphalt plants. The department will also engineer specialized plants to specific customers' needs.

B-L-H appoints White

Perry A. White, general controller of the Baldwin-Lima-Hamilton Corp., Lima, Ohio, has been named to the firm's board of directors. On the board, White succeeds Marvin W. Smith, who is retiring as chairman of the executive committee.

HRB bulletin discusses driver characteristics

Four papers on "Driver Characteristics" are contained in Bulletin 152 from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The first paper reports on personal characteristics of chronic violators and accident repeaters, a 2½ year study by the New Jersey Accident Prevention Clinic.

Two papers detail vehicle accident experience, driver training, and the effects of rest pauses and refreshments on driving efficiency. The last paper presents a pilot study on driver behavior.

Priced at 80 cents, the bulletin may be purchased from the Highway Research Board.

For men who like to underbid their competitors...

(and make a nice profit, too)

Pioneer *VIBROmatic* Paver excels all others in uniform density and quality of mat

The Pioneer Bituminous Team

The PIONEER *VIBROmatic* Paver operates on an entirely new principle. Simple in design, and easiest-of-all-pavers to operate, yet it lays a mat of exceptional quality . . . *and lays it faster than any other paver yet built!*

Secret of this unusual performance is its revolutionary *VIBROmatic* oscillating screed action which, together with the high-speed, heated vibrating compactor, lays a smooth mat with fewer voids and more uniform density than any other paver.

Performance is just as outstanding at high speeds as low. The PIONEER *VIBROmatic* has laid smooth, even mats 1½′ thick, 12′ wide at a 73′ per minute rate.

PIONEER HOT-MIX PLANTS are champions in *Mobility* and *Performance*.

First. Mobility. Only two main units; each complete on its own rubber-tired chassis. Those hours you'll save per move count up fast in dollars and cents.

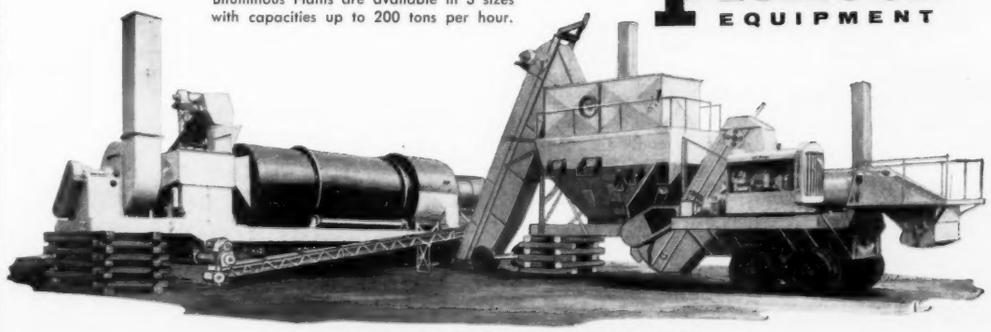
Second. Performance. Measure it by output and you'll find PIONEER *Continuflo* plants delivering up to 200 tons per hour. Measure it by quality of product? You'll discover these modern plants give exact proportioning and uniformity that meets toughest specifications. Or economy? Savings of fuel and power, efficient recovery of fines, and low upkeep help you attain a low cost per ton.

SPECIFICATIONS: BITUMINOUS PLANTS

	MODEL 51	MODEL 81	MODEL 102
Number of Units	2	2	2
First Unit	Mixer and gradation screen with 3-compartment bin	Mixer and gradation screen with 3-compartment bin	Mixer and gradation screen with 4-compartment bin
Second Unit	Drier and dust collector	Drier and dust collector	Drier and dust collector
Auxiliary Units	Feeder elevator (with necessary feeder), hot elevator and fines feeder (if desired)	Feeder conveyor (with necessary feeder), hot elevator and fines feeder (if desired)	Feeder conveyor (with necessary feeder), hot elevator, burner and fines feeder (if desired)
Rated Capacity	40-60 cu. yds./hr.	60-80 cu. yds./hr.	up to 150 tons per hour
Total Weight (Approx.)(Elec.)	80,000 lbs.	98,500 lbs.	145,000 lbs.
Approx. H.P. Required (Elec.)	120-130	145-170	270

For further information, write or call Pioneer Engineering, Division of Poor and Company, Inc., Minneapolis 14, Minnesota or your Pioneer Distributor.

Pioneer Portable *Continuflo* Central Mix Bituminous Plants are available in 3 sizes with capacities up to 200 tons per hour.



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EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 263

For more facts on insert, circle No. 265→

Well organized earthmoving fleet rushes widening of access road

A Caterpillar D8 tractor with a No. 80 scraper hauls part of the 227,000 cubic yards of common excavation, as a Cat D8 with No. 463 scraper turns around. The old ox cart road, now widened to 40 feet, is an access route to the Pan-American Highway.

Two teams of earthmoving equipment proved their efficiency on a road widening job in El Salvador. To convert in 2½ months a 27.8-mile ox cart road into an access route to the completed portion of the Pan-American Highway, the contractor used a spread of Caterpillar tractors, scrapers, and motor graders, three Euclids, and a Galion roller.

The completed road, which is 40 feet wide with a 24.2-foot asphaltic concrete pavement and 8.3-foot shoulders, was handled under a $1,648,203 contract by F. & C. Drake, San Salvador, a joint venture of Fransworth & Chambers Co., Inc., Houston, Texas, and Johnson, Drake & Piper Overseas Corp., New York, N. Y. The new all-weather road extends from El Playon to Usulutan.

Excavation work

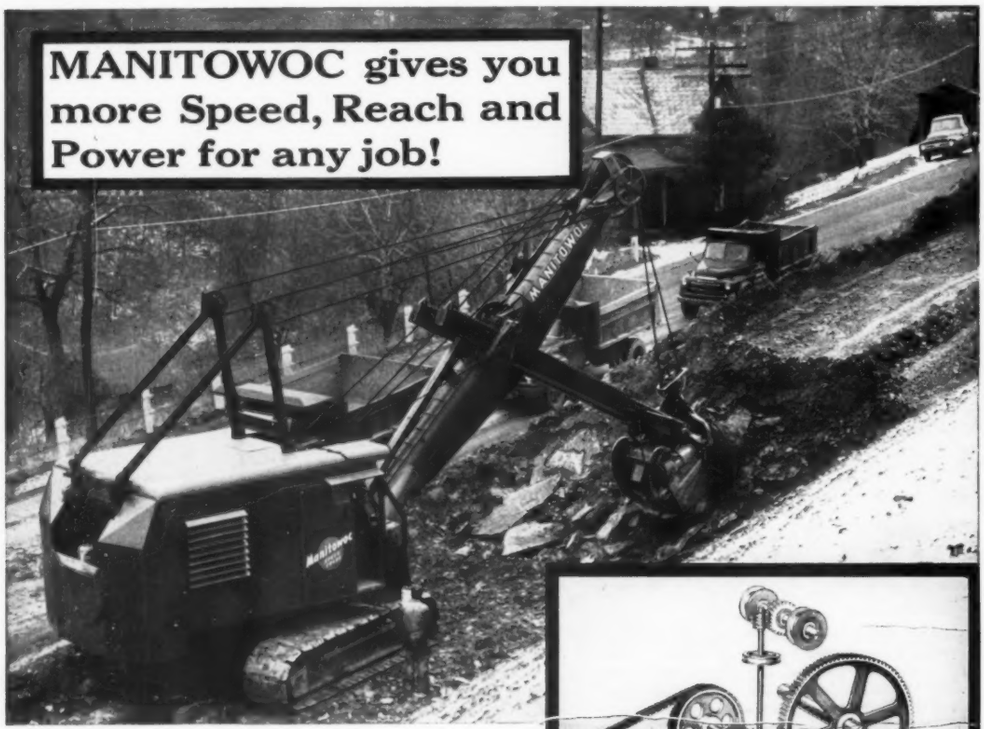
The 370,000 cubic yards of excavation was handled by two equipment teams. For the 227,000 cubic yards of common excavation, Vincent Hryhorchuk, project manager, used three Caterpillar D8 tractors pulling one Cat No. 80 and two No. 463 scrapers. The 144,000 cubic yards of select subbase were loaded by a Caterpillar No. 977 Traxcavator into a fleet of 16-yard Ford dump trucks. Two more D8's and two D6's carved out the new road bed and spread the fill.

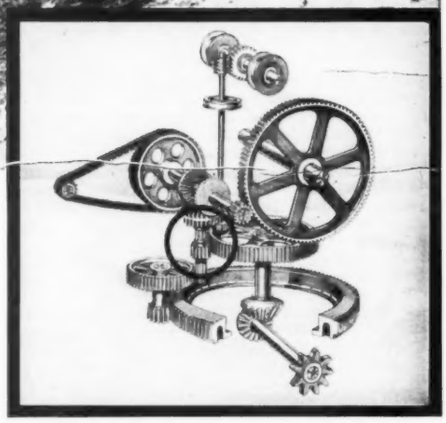
Fill and aggregate were compacted by a sheepsfoot roller pulled by a Caterpillar D6 tractor, a Galion steel-wheel roller, and a pneumatic roller pulled by a Case farm tractor. Aggregate was hauled in three Euclid 1UD's. Two Caterpillar No. 12 motor graders shaped and graded the road.

Other major requirements for the work included laying 1,278 feet of concrete pipe, from 24 to 60 inches; 326,000 square yards of stone base course compacted in place; 93,400 gallons of bituminous prime coat; and 326,000 square yards of surface course asphaltic concrete.

The job, which started on March 1, was completed on May 15. Project manager Hryhorchuk was assisted by Pete Rocco, superintendent; Rue Wright, administrative manager; Sam Falkner, asphalt foreman; Alex Mills, crusher foreman; and John Campos, master mechanic.

THE END





· Successful contractors base their bids on a Manitowoc's ability to produce big yardage output — in less time — at lower cost. For instance, R. J. Nichols of New Bethlehem, Pa. uses a Manitowoc 2-yd. Model 3000 shovel to tackle a $1,134,000 highway job for the State of Pennsylvania. The work involves widening a 10 mile, 2-lane highway 4' on each side and eliminating dangerous curves. An estimated 165,000 yards will be excavated before the job is completed. As a long-time user of Manitowoc equipment, Mr. Nichols, like many other prominent contractors, knows he can depend on his shovel to deliver more speed, reach and power to finish the contract on time — at a profit.

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Simple Crawler Drive has positive, jaw-type steering — extremely maneuverable in tight quarters. **Completely Enclosed** travel gears and clutches keep going longer with less downtime. **Simple, Accessible Main Machinery** makes full use of power — is easy to get at for convenient servicing. **Dependable, Disc Type Clutches** are easily adjusted, with discs replaceable in minutes. **Smooth-Acting Air Controls** are available to keep your shovel runner at top operating efficiency the entire shift. **Self-Removing Counterweight** is available for fast, simple moves between jobs within highway load restrictions.

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EXCLUSIVE SLIDING PINION arrangement (circle) makes use of only one set of clutches for travel, swing and boom hoist. Only working gears turn — all others are disconnected — for full power at the dipper.

ONLY 3 MAIN SHAFTS cross the rotating bed.

FEWER GEARS AND PINIONS — only 17 are needed in the Model 3000.

GREATER ACCESSIBILITY reduces downtime for maintenance and servicing.

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SHOVELS 1-5½ YD. Speed Crane CRANES 20-100 TON

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New lock under construction on the Warrior River, Eutaw, Alabama. Another important project where the contractor, Massman Construction Company of Kansas City, Missouri, used Gulf petroleum products exclusively.

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New Plattsburgh (New York) Air Force Base for B-47 bombers is nearing completion. Photo above shows 11,760-foot runway under construction by Winkelman-Tomkins-Jones of Syracuse, N. Y. Gulf furnished 90% of the petroleum products used by *all* contractors on this huge project.

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- Your Gulf Sales Engineer is at your service to help you achieve the most efficient use of petroleum products. And he's backed by 1300 scientists and engineers at the Gulf Research Laboratories. This pool of technical know-how is yours to command.
- Gulf quality fuels and lubricants insure top engine performance . . . help you avoid mechanical delays. You'll have a smoother-running job . . . and lower maintenance costs.

Spanning the Delaware to connect the New Jersey Turnpike and the State Expressway is the Packer Avenue Bridge. Contractors Booth & Flinn, of Pittsburgh, use Gulf petroleum products exclusively.

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Fast work opens route before tourist season

When heavy rains in the Blue Ridge Mountain area of North Carolina caused a washout at Craven's Gap near Ashville, tumbling 4,000 yards of earth and rock down the mountainside, a 1,000-foot section of the highway was damaged.

To clear a one-way passage for tourist traffic, contractors used a Hough HF Payloader. This 1-yard-capacity, rear-wheel-drive unit, and a Quick-Way shovel, moved the heavy fill material to rebuild the damaged section of the highway.

Construction crews blasted other areas for fill to be used in repairing the washout. After filling operations has been completed, the section was repaved and ready for traffic before the tourist season got well under way.

The Model HF Payloader loads small rock and dirt into a Ford dump truck as a Quick-Way shovel picks up larger rock to clear a one-way passage after a washout along the scenic drive in the Blue Ridge Mountain area.

Text covers technical data on steel casting

"The Casting of Steel", edited by W. C. Newell, provides steel founders and engineers with a guide on the technical aspects of the production of steel castings. Published by the Philosophical Library, Inc., the book discusses the properties, basic principles, and applications of steel and refractory metal.

Other chapters detail the mechanism of solidification, the melting process, the use of refractories, pattern making, and mould preparation and coremaking. The remaining chapters cover casting into sand moulds, centrifugal formation of castings, the investment casting process, heat treatment and properties of steel castings, mechanical testing, radiography, and non-destructive testing. Pictures, graphs, diagrams, tables, charts, and formulas supplement the written material. A list of references appears at the end of each chapter.

Priced at $27.50, the book may be purchased from the Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y.

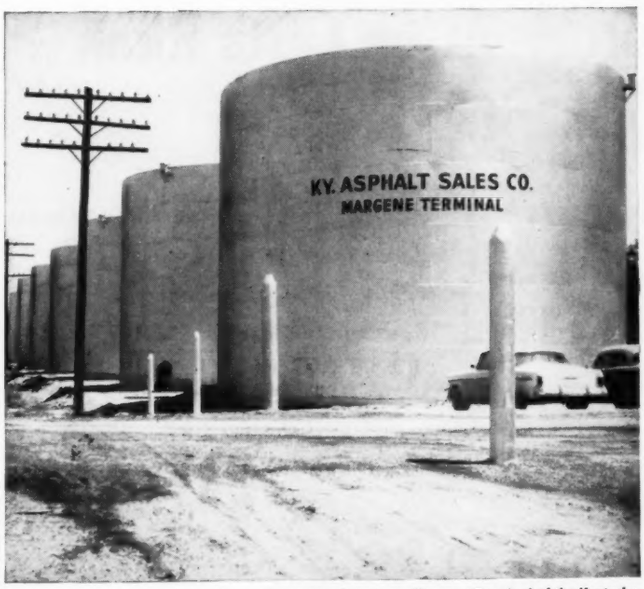
Land for highway use analyzed in HRB book

An analysis of relevant court decisions concerning "Acquisition of Land for Future Highway Use" is the topic of Special Report 27 of the Highway Research Board. In addition to a discussion of highway cases, other areas of public and quasi-public works are inspected for insights in and approaches to the problem.

Pertinent statutes which specifically authorize the acquisition of land for highway use are collected and analyzed. A section of the report details the various methods several states have used to finance future highway land. Rounding out the report is a brief survey of several legal tools, such as marginal land acquisition and zoning, which aid in acquiring land. Several appendices contain briefs of important cases.

Priced at $3.20, the bulletin may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Asphalt moves
Hot and Fast
at South's largest marine terminal

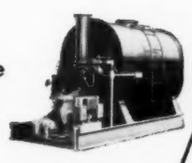


Storage tanks at new Margene Terminal of the Kentucky Asphalt Sales Company, Eddyville, Kentucky.

Asphalt barges unloading at docks. Steam from Cleaver-Brooks boilers brings asphalt to pumping temperatures.

Peak-Temp Oil Booster as installed at terminal for fast heating of asphalt in tanks.

Kentucky Asphalt Sales Co., Margene Terminal, speeds heating and handling of asphalt — from barge to storage tanks to trucks — with Cleaver-Brooks Boilers, Peak-Temp units, and Boosters



Cleaver-Brooks packaged boilers, oil, gas, or combination oil/gas fired — for steam or hot water. Sizes 200 to 600 hp.

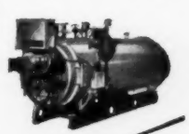
The new, modern 7,000,000-gallon capacity terminal, recently completed at Margene by the Kentucky Asphalt Sales Company of Eddyville, is a model of thorough planning and efficient equipment.

Asphalt is transported by river barges direct from refineries to the docks at Margene. Steam, provided by two Cleaver-Brooks packaged boilers, heats it to pumpable temperature (250°F) on the barges. The asphalt is then transferred to storage tanks.

It is again heated to 325° to 350°F in the tanks by a Cleaver-Brooks Peak-Temp Automatic Oil Booster and transferred to motor trucks with a Cleaver-Brooks Pumping Bituminous Booster. The trucks serve an area within a 300-mile radius of the terminal.

This new terminal is an outstanding example of how a combination of Cleaver-Brooks heating equipment speeds operations and cuts costs in the handling of asphalt. Write for bulletins and complete information on Cleaver-Brooks self-contained, oil- and gas-fired boilers and Peak-Temp Oil Boosters.

Peak-Temp Oil Booster uses high-flash-point oil. Self-contained. Available in 2 sizes, skid-mounted.



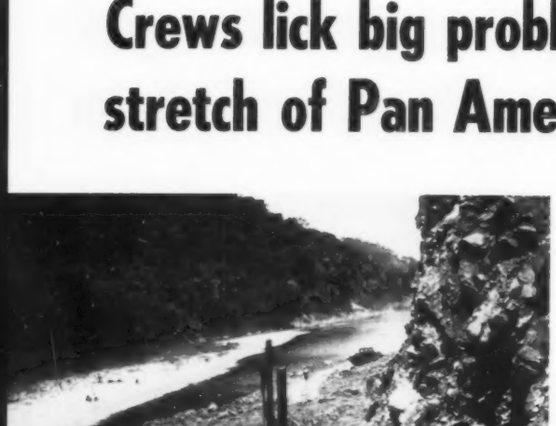
Cleaver Brooks 25th YEAR

CLEAVER-BROOKS COMPANY, Dept. H, 397 E. Keefe Ave. Milwaukee 12, Wisconsin

For more facts, use Request Card at page 18 and circle No. 266

A Caterpillar D8 pioneers a stretch on the steep mountainside above the Rio Terraba. The road will follow the river to Palmar, then follow a banana company railroad to an existing road in Panama.

Crews lick big problems on Costa Rican stretch of Pan American Highway



In the rock section north of Rio Terraba, Gardner-Denver Air Tracs send 3½-inch holes into rock. In this section, deposits are mostly limestone, trap rock, shale, and volcanic breccia.

Rock, clay, rainy season make 87-mile section most difficult to date; river craft, vehicles, planes carry supplies to remote job location

by STANLEY SELENGUT

Inaccessibility is enough to make two adjacent projects the most difficult to date on the Pan American Highway. But big rock cuts, clay problems, the rainy season, a shortage of sand, and route changes are making job problems the rule on this stretch.

To reach both projects in Costa Rica, men and equipment first have to travel up the Rio Terraba by light-draft landing-type vessels to the port of Puerto Cortes. The trip from here to the centrally located construction camp at Palmar is made by access road.

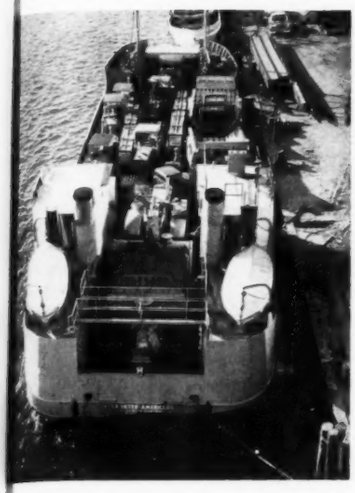
In addition to river vessels, the contractor constantly uses its plane, a De Haviland Beaver, and has chartered over seven C-46 flights to get supplies to the site. A radio setup for communication between the job and the office in San Jose, Costa Rica, is invaluable in keeping the project rolling.

Route change

The Pan American Highway, which in Mexico and Central America is officially known as the Inter-Ameri-

A blast cuts deep into the mountainside. The 55-mile section from Platanares to Ballast Pit is being built under a $9,607,185 contract, the largest single contract awarded by the Bureau of Public Roads.

A Lima 1201 with 3½-yard dipper loads an Athey 25-yard-capacity rock wagon. The Cat DW21 will pull the loaded wagon to the river so that the rock can be wasted.



The contractor's "La Inter Americana" takes earthmoving rigs aboard at Miami for the trip to Costa Rica. The craft, 35 feet wide and 135 feet long, has a 6-foot draft with a 450-ton load. Ten Costa Ricans man the vessel.

can Highway, was originally planned from Buenos Aires in south central Costa Rica to El Volcan in Panama. This route was changed for economic reasons and to make the port of Golfito accessible by land. The road now follows the original route up to Paseo Real on the Rio Terraba, then cuts west, following the river to Palmar. From Palmar it follows the banana company railroad southward until it joins an existing road at La Concepcion in Panama.

The two adjacent projects covering the 87-mile distance from Platanares to the Panamanian border are being handled by Foster-Williams Brothers Co., a joint venture of Foster Construction, S. A., San Jose, Costa Rica, and Williams Brothers Co., Tulsa, Okla.

Project Four runs the 55 miles from Platanares to Ballast Pit, and its price of $9,607,185 makes it the largest single contract ever awarded by the U. S. Bureau of Public Roads. Project Six, going the remaining 32 miles from Ballast Pit to the border, was let on a $2,733,765 bid.

River craft built

The "Inagua Rover", a craft of the West Shipping Co., Inc., brought in the first load of equipment for the job. This included two Caterpillar D8 tractor-dozers, a D6 tractor-dozer, a Lorain Moto-Crane, two 125 and two 210-cfm Gardner-Denver compressors, four Willys Jeep pickups, an Adams 412 motor grader, two Cat generators, and a number of tools and pieces of shop equipment.

But because of the high cost of shipping and difficulties in securing craft that could navigate the Rio Terraba when needed, the contractors decided to have a company vessel built.

"La Inter Americana", constructed after the plans of the Inagua Rover, is 35 feet wide, 135 feet long, and draws a 6-foot draft when it is loaded with 450 tons. Powered by two Caterpillar 400-hp engines, it has a tank capacity of 100,000 gallons of gasoline or diesel fuel and is manned by ten Costa Ricans.

The vessel has already made six trips from Miami to Costa Rica and, based on conference shipping rates, has amortized her cost. The ship is now working on company fuel deliveries off the coast of Costa Rica, since all fuel has to be brought in from nearby ports either by company or chartered vessels.

Stockpiling supplies

One of the big preliminary jobs was that of building up a stock of spare parts, food, and supplies valued at more than $750,000. A stockpile this large is necessary because it takes over a week to receive emergency supplies. A breakdown could tie up the job for weeks if repair parts were not already in stock. A large amount of food has to be kept on hand because the camp sometimes becomes completely isolated during the rainy season. Virtually all supplies for the work and the crews have to be imported from the United States.

The outlay for the stockpile of supplies was minor compared to other costs of gearing up for the job. An electrical plant costing more than a half million dollars, a water system, a sewerage disposal system, garage, and repair shops had to be built, along with a storage system for fuel. And a total of 3½-million in new earthmoving equipment—most of it Caterpillar and Gardner-Denver—was brought to the site.

Rock cuts

North of the Rio Terraba, the road will be on a cliff 100 feet above the river, which it parallels through the tropical area. This section is mostly

(*Continued on next page*)

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Earthmoving equipment gouges out a shelf along the mountainside so that road crews can follow. Some 20 large box-type culverts are included in these two projects.

(*Continued from preceding page*)

a rock job, the terrain consisting of deposits of limestone, shale, trap rock, and volcanic Breccia. Most of this has to be blasted. At all cut areas, including the big ones at El Zapo, Zapote, and El Cajon, the contractor is using Gardner-Denver Air Tracs to put down the 3½-inch holes. There are twelve of these rigs on the job, operated by six 900-cfm rotary compressors.

After holes have been blasted with 3×30-inch dynamite, the blasted rock is pushed over the side by Cat D8 or D9 tractor-dozers to be wasted in the river. In the cuts, a Lima 3½-yard shovel loads Caterpillar DW21's hauling Athey 25-yard rock wagons. Most of this excavation is also dumped into the Rio Terraba.

Clay is troublesome

South of the Rio Terraba, where the work is mostly a dirt job with some white limestone rock cuts, there is a serious clay problem. Most of this section consists of an A75 silty clay that is highly expansive and retains a large amount of water. It has very little supporting value, and cut slopes slide in.

Daily rains make such an impassable mess of the clay that the contractor would only be able to work at the height of the dry season if he did not take limestone from the cuts and spread it over the clay as he progresses. This limestone also makes a good selected borrow base course.

The stone is being broken up by a Caterpillar D8 with a Cat ripper. Cat 470 scrapers of 25-yard capacity, pulled by Cat DW21's and pushed by a Cat D9, are loading the broken stone.

This low clay section will have to be abandoned as the rains get heavy, because the wheels of the Cat DW21 will just spin in the saturated clay when the scraper is loaded. Then, even the limestone topping will not hold the rigs up. When this work stops, the equipment will be moved to the northern side of the project where some of the large cuts are being saved.

As of March 31, 2,250,378 cubic yards of the estimated 5,614,000 cubic yards of unclassified excavation in Project Four had been moved. This job started in July, 1956. On Project Six, which started last December, 39,240 of the 1,700,400 cubic yards of excavation was completed by March 31.

Both projects are scheduled to be completed by May 30, 1958, but it is expected that this time limit will be extended because of certain difficulties beyond the contractor's control. There have been frequent design changes; more than 75 per cent of the total job has been relocated; and there have been right-of-way problems. Also, the southern section of the job runs through much of the United Fruit Co. banana plantations, and there is quite a bit of fencing to be done and a number of clearing problems to be solved.

Problems with culverts

Included in the contracts are more than 200 large box-type culverts. Wherever possible, Cat D8's are being used to excavate for the structures; where this is impractical, a Lorain Moto-Crane is being used as a dragline for the work. The culverts are being built with Universal forms, and backfilling is handled by a Cat D6 tractor-dozer.

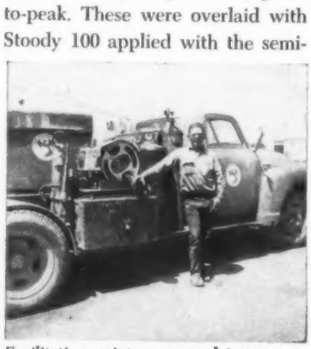
Concrete for the culverts is being mixed in Rex 11S and 16S mixers.

Since their last major rebuilding, this 18"x30" Pioneer roll crusher has produced 30,000 tons of aggregate. Twice-a-week touch-ups with Stoody 100 hold wear to a minimum.

STOODY SEMI-AUTOMATIC HARD-FACING helps maintain road schedule in HIGH SIERRAS

A new 16½ mile State Highway between Shaver Lake and Huntington Lake in the high Sierras was recently completed by Phoenix Construction Co. of Bakersfield, California. One interesting feature of the job was the preparation of aggregate which was supplied by portable crushers operating near the site. Material used was quarried blue granite. Primary reduction was effected by jaw crushers followed by a final roll crushing operation. 210,000 tons of aggregate were required, as well as production of sand from the same material. Crusher rolls consequently suffered considerable wear.

The crusher corrugations were completely rebuilt with Stoody Manganese, spacing about 3" peak-to-peak. These were overlaid with Stoody 100 applied with the semi-automatic welder. Wear was never permitted to reach the manganese shell thereafter. During shut-downs, corrugations were retouched with Stoody 100, as required, restoring full efficiency for the following shifts.



Facilitating maintenance work is this portable semi-automatic welding machine. Quickly hauled to the site, it is dismounted from the truck for use.

Hard-facing methods for most successfully maintaining all your wearing equipment are fully described in the Stoody Guidebook and folder covering semi-automatic procedures. Ask your Stoody dealer for a copy (see the "Yellow Pages" of your phone book) or write direct.

STOODY COMPANY
11936 East Slauson Avenue
Whittier, California

For more facts, use Request Card at page 18 and circle No. 268

The chief difficulty on this work has been the lack of sand for the mix. The natural river sand has a 30 to 40 per cent shale content that cannot be washed out, and all sand has to be manufactured from the granite rocks found in the river. This job is being done by a Cedarapids portable crusher, consisting of a primary unit with 10×25 jaw crusher, 22×30 secondary roll crusher, and 25×42 sand attachment.

Difficulty with scour

The largest bridge contract on the entire Inter-American Highway covers construction of a span in Project Four that crosses the Rio Terraba and connects Palmar North and Palmar South. This 1,170-foot-long bridge consists of deck spans and three trusses.

The biggest problem here was with scour. The water level in the river has risen as much as 40 feet in heavy rains and, after crews strung a lead line across the river, scour was found to be over 25 feet. This meant that pier excavations had to be carried very deep. Two of the six pier footings are more than 10 feet below sea level, and one is at sea level.

To date, this is the only bridge contract awarded in the Costa Rica-Panama gap. A separate contract will be let for the other thirty bridges required on the highway.

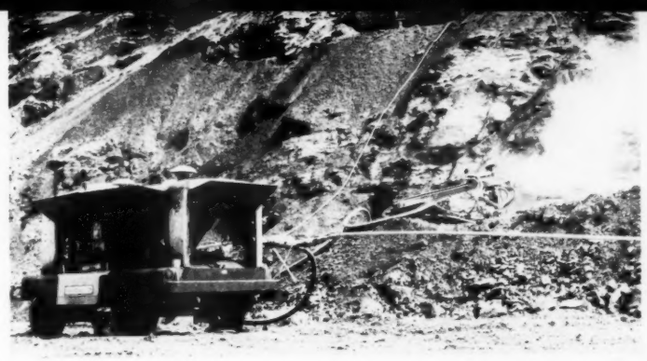
This means that even if Projects Four and Six are completed on schedule next June, and the sections flanking Prjoects Four and Six are completed at the same time, the road will be good only for dry weather travel by four-wheel-drive vehicles capable of fording rivers.

At the north end of the Foster-Williams sections, 43 miles of highway are being built by the Costa Rican firm of Beeche, Fait, Quiros, & Ulate. This stretch, most of which requires heavy earthmoving, will run to an existing road at San Isidro de General. The June completion date is also effective for the section on the south end of the Foster-Williams projects, a section that will run from the border of Panama to an existing road in that country.

The entire stretch between Costa Rica and Panama will be about 19½ feet wide and have a 6½-foot shoulder on each side. The ditches will be from about 1 to 6½ feet wide. Slopes range from ¼ to 1 up to ½ to 1, depending on the stability of the bank. In one section, a 1 to 1 slope has been required because of landslides.

Seven hundred men, only eighteen of them Americans, are constructing the two Foster-Williams sections. The project manager for the work is Zeb Ward. Grant Foster is devoting most of his time to supervising the entire project. Harry Worheiser is in charge of general operations in San Jose.

THE END



Six big Gardner-Denver 900-cfm compressors like this one supply air to the Air Tracs working on the ledge. Most of the equipment being used on the projects had to be imported from the United States, sent upriver, and taken by access road to the work site.

David White appoints

Melvin D. Ratcliff has been appointed district sales manager for the David White Instrument Co., Milwaukee, Wis. He will promote and sell the firm's products in Georgia.

For more facts, circle No. 269→

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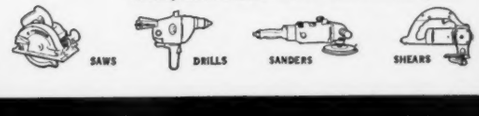

A Manitowoc crane with 90-foot boom and 20-foot jib places 12×12-inch bracing inside the cofferdam needed to build the reinforced-concrete box culvert that will support the turnpike roadways at Greenwich Harbor.

Culvert jobs require different techniques on turnpike contract

Two different methods were used by a contractor for two extremely long culverts at the mucky Greenwich Harbor stretch on a 2½-mile-long Connecticut Turnpike contract.

This work by Slattery Contracting Co., Maspeth, N. Y., was done under a $7,336,146 contract that also calls for 800,000 cubic yards of rock excavation, 500,000 yards of roadway excavation, eight overpass and underpass structures, and the removal of more than 100,000 yards of harbor muck. At the virtually inaccessible mid-point of the mucky section, muck removal was done by a small hydraulic dredge, while 2-yard draglines worked the shorelines.

In order to get proper foundation conditions for one of the culverts, the contractor excavated an 8-foot-wide trench in backfill material that had been placed through a mucky stretch. Located at a point where an approach ramp will pass across a narrow area of the harbor, the corrugated metal culvert is 66 inches in diameter and 840 feet long. It was built in 16 and 18-foot sections that were shipped by trailer truck from the New England Metal Pipe Culvert Co., Palmer, Mass.

The second drainage structure, a box culvert 20½ feet high, 22 feet wide and about 400 feet long, was built in an entirely different manner.

This reinforced-concrete culvert, supporting the turnpike roadways, was located relatively near the existing harbor shoreline.

Since a cofferdam was required for the culvert construction, a portion of the hydraulic fill was placed to extend the shoreline out to the proposed cofferdam location. This provided equipment and materials with free access to the cofferdam.

The 250-foot-long and 33-foot-wide cofferdam was driven to build a straight upstream section of the culvert. A second cofferdam was later built and connected to the first to complete the length of the culvert and the widened outlet.

The 32-foot long Bethlehem and United States Steel interlocking sheet piling was driven for the cofferdam by Horn Construction Co., Inc., Merrick, New York. This was done under a subcontract that included the driving of 27,000 linear feet of 8-inch-diameter timber piling, 10 to 50 feet in length, to support the concrete

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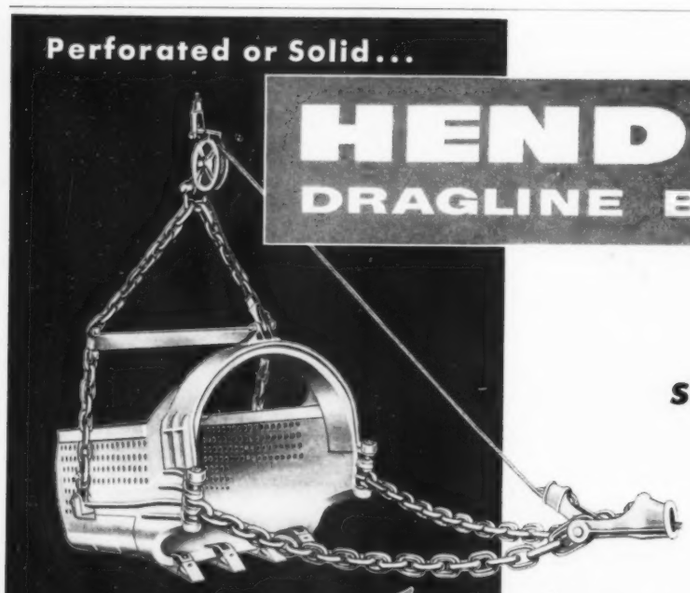

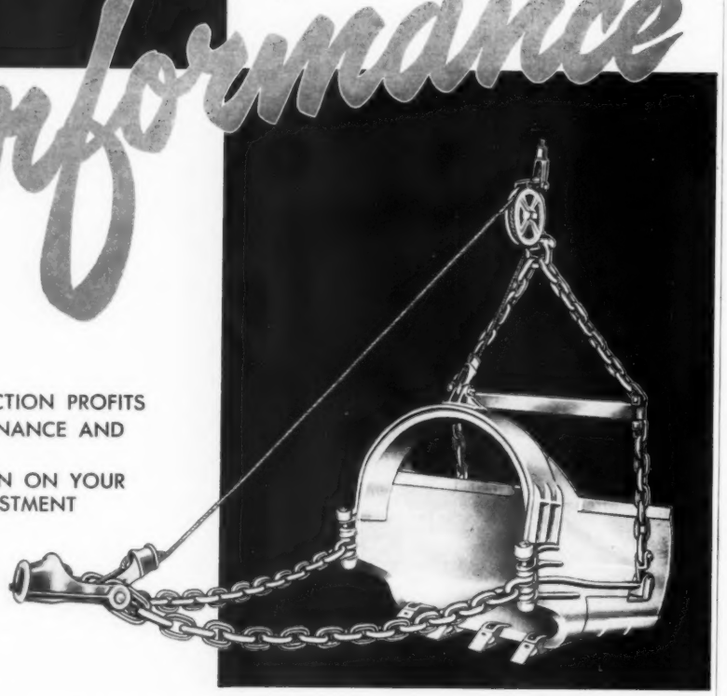

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MANSFIELD, LOUISIANA

For more facts, use Request Card at page 18 and circle No. 270

Short stretch calls for rock, earth, muck excavation, construction of eight overpasses and underpasses

Two different methods were required for the structures. Of the eight, only this one was supported on spread concrete footings instead of steel H-piles. The forming crew is completing work on the ¾-inch plywood forms.

box culvert. The subcontract also included driving 10-inch H-piles for the bridge piers, and excavation of the cofferdam.

A Manitowac crane with a 90-foot boom and 20-foot jib, equipped with a McKiernan-Terry 10-B-3 steam-operated hammer, was used by Horn to drive the sheeting; a second crane with a 60-foot boom and a 2-yard clamshell excavated muck from the cofferdam. A Littleford Kwik-Steam generator, mounted on the rear of the Manitowac crane, supplied steam for the hammer.

As the sheeting was driven, 12×12-inch timber bracing was installed to support the walls of the cofferdam. The box culvert, which will be topped with about 20 feet of roadway fill, will carry water from an existing stream that empties into the harbor.

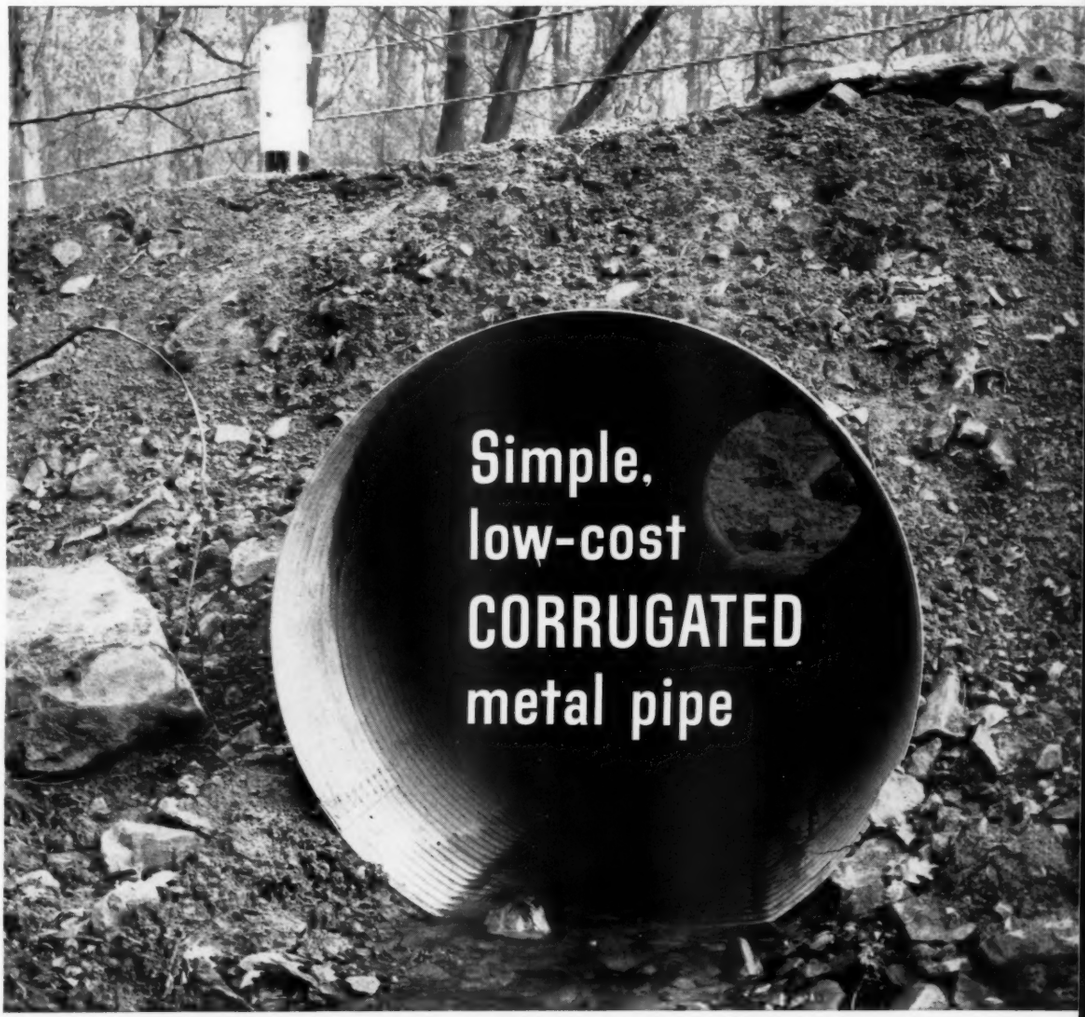
Rock Excavation

A total of 800,000 yards of rock scattered throughout the length of the project had to be removed; the deepest cut went to 54 feet. This job was handled by a fleet of Gardner-Denver Air-Tracs and Ingersoll-Rand wagon drills. Two of the Ingersoll-Rand drills were mounted on a jib rig attached to an International tractor. These were powered by a Jaeger 600-cfm air compressor. The Air-Tracs sunk 3-inch holes and the wagon drills, 2½-inch holes, using carbide insert drill bits. Powering the drilling equipment were Jaeger, Worthington and Chicago Pneumatic 600-cfm air compressors—working in banks or alone. Slattery used 6×6-foot and 8×8-foot drilling patterns, and up to eight milli-second delays per blast, to sink the 24-foot deep holes. The holes were blasted with Red Cross and Du Pont 40 per cent special gel to obtain 1 cubic yard of rock for every 0.75 pound of dynamite used.

Blasted rock for the roadway fill was loaded at different locations along the job by three 2½-yard shovels. Hauling the rock to the fills were Euclid 14-yard rear-dumps and five LeTourneau-Westinghouse 27-yard rear dumps. Slattery used no scrapers during the grading phase of this contract, since most of the work consisted of cutting down rock outcrops along the job and using the material in adjacent fills. One Cater-

(*Concluded on next page*)

For more facts, circle No. 271→



Culvert on New Kensington, Pa. by-pass. Fabricated from USS Galvanized Corrugated Culvert Sheets by United Steel Fabricators, Inc., Wooster, Ohio. Installed by Adam Eidemiller Construction Company, Greensburg, Pa.

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7-1004

UNITED STATES STEEL

Rock excavation on the short but expensive 2½-mile stretch is handled by two Ingersoll-Rand wagon drills mounted on a jib rig attached to an International tractor, plus a Gardner-Denver Air Trac, right.

This was the technique used to control dust on the job. The 1,200-gallon water tanker is being pulled by a Caterpillar D6 tractor with a front-end loader attachment.

(*Continued from preceding page*)

pillar D9 and eight D8 tractor-dozers were used to spread the fills and push cut material over the relatively short haul distances.

All but one of the eight bridge structures were founded on 10-inch steel H-piles driven to refusal. Slattery used ¾-inch plywood forms, backed with 2×6-inch studs and wales tied with Richmond Tyscrus to form the reinforced-concrete piers and abutments of the structures.

The two divided, 36-foot, reinforced-concrete roadways, which will be separated by a 30-foot grassed median, will be supported on a 24-inch-thick gravel subbase through rock cut sections; a 12-inch gravel subbase through earth cuts; and a 6-inch subbase through earth-filled sections. Each roadway will consist of three 12-foot lanes having a 10-foot-wide asphalt outside shoulder. The outside lane for each roadway will have a slab 10 inches thick while the two inside lanes will be 9 inches in depth.

The contractor is equipped with an RCA mobile radio hook-up for key personnel throughout the project. A base station, located in an abandoned house used as the contractors' headquarters, operates on 27.31 megacycles to keep in touch with the superintendent, assistant superintendent, blasting foreman, and the maintenance department.

Personnel

Patrick Kelly is the superintendent, and Frank Kelly, the assistant superintendent, for Slattery. The chief engineer for the contractor is Leonard Peterson, and Murray Golub is the office engineer. John Stormfeltz is the resident engineer for Gannett, Fleming, Corddry & Carpenter, Inc., Harrisburg, Pa., the consulting engineering firm on this Greenwich, Conn., section of the new $430 million toll road. THE END

B-K to combine offices

Blaw-Knox Co., Mattoon, Ill., will combine its New York and Philadelphia sales offices into a new Eastern regional sales office to be located in Haddon Heights, N. J.

As part of the move, the company has also opened a small office at 230 Park Avenue, New York City.

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avoid legal pitfalls

Arbitration agreement was binding to companies

THE PROBLEM: *Two companies made joint venture agreements to perform two jobs that had been awarded to one of them. One company furnished the necessary capital and the other company, which held the construction contracts, furnished the necessary equipment and labor. Profits or losses were to be equally shared. Under provisions of the agreements, disputes that might rise between the two companies were to be arbitrated. Were the decisions by any two of the three arbitrators binding on questions involving the meaning of the agreements and the rights of the parties?*

THE ANSWER: Yes. (Application of Downer Corporation, 304 Pac. 2d 756, decided by the California District Court of Appeal, Third District.)

The court decided that a meeting of the arbitrators was not void because only two of the three arbitrators were present and concurred in the arbitration award; and that the arbitrators had a right to consider interest due either of the parties from the other. An arbitration award will be considered by the courts to have been fairly arrived at until an objecting party proves the contrary.

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Materials supplier was not in default

THE PROBLEM: *Plaintiff had a railroad construction contract and needed crushed rock materials. The defendant agreed to provide specified quantities to be stockpiled at a certain place, and to supply more if needed. The defendant stockpiled the specified quantities, but moved the crusher in April, at about the time that plaintiff's job was supposed to be completed. Completion was delayed and, after exhausting the stockpile in early September, the plaintiff demanded that the defendant immediately provide further materials. The defendant offered to furnish them by October. Rejecting the offer, the plaintiff secured substitute materials elsewhere, and sued the defendant for what they cost above the agreed price. Was the plaintiff entitled to collect?*

THE ANSWER: No. (Hulme v. Sweetman Construction Co., 230 Fed. 2d 66, decided by the United States Court of Appeals, Tenth Circuit.)

The court said plaintiff unduly delayed notifying the defendant of his need for additional materials and then unreasonably refused to give the defendant time in which to provide them. The defendant was not bound to keep its rock crushing equipment at the original location against the possibility that the plaintiff might need additional materials.

Employee's guaranty of work was void

THE PROBLEM: *An excavating firm completed a private dam to store surface water. The owner sued for damages, claiming that the dam leaked, despite a guaranty that it would not. At the trial, the owner testified that a member of the firm had orally made such a guaranty. This was overcome by the latter's testimony that there was a mere warranty that it would be constructed according to specifications, and that the subsurface conditions prevented assurance that there would be no leakage. The owner relied principally upon a positive guaranty by the firm's employee, a bulldozer operator who did the work. Did the trial judge properly rule that guaranty out as not being binding upon the excavating firm?*

THE ANSWER: Yes. (Bowman v. Watts, 91 So. 2d 238, decided by the Alabama Court of Appeals.)

The court noted that all contractual arrangements for constructing the dam were made by a member of the excavating firm, and that there was nothing to show that the employee was specially or implicitly authorized to guarantee the work on behalf of the firm.

Incidentally, it appeared at the trial that it was doubtful whether lowering water in the dam was due to leakage or evaporation by drought.

Picketing was lawful

THE PROBLEM: *A Colorado building contractor employed non-union labor at lower wages than locally paid union labor. Two pickets—later only one—were posted by the union in a street near the contractor's construction site. Both men carried a picketing sign saying that substandard wages were being paid. The picketing was peaceful. Union drivers and de-*

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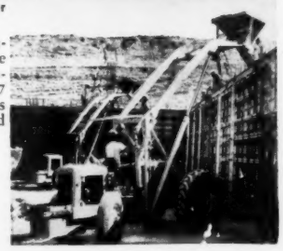

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avoid legal pitfalls

liverymen refused to cross the picket line to deliver materials and supplies to the contractor. Was he entitled to enjoin the picketing?

THE ANSWER: No. (Pueblo Building & Construction Trades Council v. Harper Construction Company of Colorado, 307 Pac. 2d 468, decided by the Colorado Supreme Court.)

Bond covered haulage

THE PROBLEM: *A statute required a public improvement contractor to give bond to "pay all debts incurred for labor or material furnished in the construction of said public building or in making said public improvements." A subcontractor hauled a highway contractor's equipment to and from a project site. Was his claim for pay covered by the highway contractor's bond?*

THE ANSWER: Yes. (National Automobile & Casualty Insurance Co. v. Adair, 292 Pac. 2d 403, decided by the Oklahoma Supreme Court.)

City, contractor liable

THE PROBLEM: *A new street surface was 1⅓ inches above a busy crosswalk level. A pedestrian was injured when she stubbed her foot and fell at the elevation. Were the city and contractor jointly liable?*

THE ANSWER: Yes. (Smith v. City of St. Joseph, 297 S. W. 2d 578, decided by the Kansas City, Mo., Court of Appeals.)

The court said the circumstances were such that both defendants should have foreseen and guarded against such an accident, and the accident was not due to plaintiff's neglect to use due care in crossing the street. The contractor's work at that point had not been completed and apparently had not been accepted by the city.

Beneficiary sued on bond

THE PROBLEM: *A subcontractor gave bond to the prime contractor on a federal project to pay for labor and materials used in performing the subcontract. Was a materialman a beneficiary of the bond in such sense as to be entitled to sue on the bond?*

THE ANSWER: Yes. (Pacific National Fire Insurance Co. v. Cummins Disel of Georgia, Inc., 96 S. E. 2d 881, decided by the Georgia Supreme Court.)

Adjusting net losses on government projects

THE PROBLEM: *A contractor sued to recoup loss sustained, by no fault of his, in constructing a government dam. The case was governed by a presidential regulation governing computation of net losses, and disallowing as a performance cost, "interest on invested capital". Was the contractor entitled to include as a cost interest on money borrowed for construction purposes?*

THE ANSWER: Yes. (Warner Construction Co. v. United States, 115 Fed. Supp. 465, decided by the United States Court of Claims.)

The court supposed that the disallowance of interest on invested capital was intended to prevent a contractor from earning interest on his own funds employed on the project. It was recognized that the effect was to discriminate "somewhat in favor of the impecunious contractor who is obliged to borrow his working funds, and against the well financed contractor who operates with his own funds".

Another item involved in the suit concerned the amount of fire insurance that the contractor collected for pieces of equipment that were destroyed on the site, in excess of the depreciated book value of the equipment. Other equipment was sold for more than its depreciated book value. The operation had been charged with all of such depreciation. The court decided—two justices dissenting—that the full amount of the excesses of proceeds of the equipment above depreciated book value should not be charged against the contractor in computing loss on the entire job. It was conceded that if the rate of depreciation which the contractor charged in computing losses was unjustifiably high, it should be cut down to a reasonable figure. But it would not be proper, the majority of the court said, to offset against the contractor's losses in constructing the dam, profit that it may have made in selling the equipment to outsiders.

Unlicensed contractor's right to retain payment

THE PROBLEM: *California law requires that a contractor be licensed; an unlicensed contractor cannot compel payment under a contract. But where the contractor has fully performed and the owner, having received full value, pays the contract price, can he later sue to compel a refund?*

THE ANSWER: No. (Comet Theatre Enterprises, Inc., v. Cartwright, 195 Fed. 2d 80, decided by the United States Court of Appeals, Ninth Circuit.)

The decision was based on the fact

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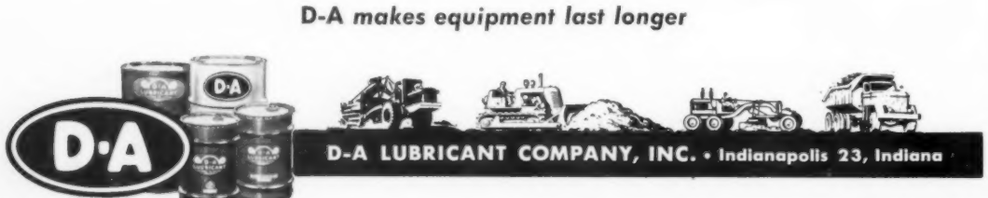

For more facts, use Request Card at page 18 and circle No. 274

that the licensing statute does not provide that the owner can sue to compel a refund.

The court reviewed other decisions concerning rights of parties where an unlicensed business has been carried on. In one case the business was carried on by a partnership and was being wound up. The liquidating partner agreed to give his associate one-third of the assets, but later refused to do so because the business was illegal, being unlicensed. A California appellate court decided that, although neither could have enforced a claim for breach of the partnership agreement, there was no reason why the agreement for division of the remaining assets should not be enforced. (Norwood v. Judd, 209 Pac. 2d 24.)

An example of the kind of case in which a contractor may be required to disgorge was found in another California case where a taxpayer was entitled to compel a refund for public benefit. (Miller v. McKinnon, 124 Pac. 34.) There the contract was void because it was awarded without competitive bidding, and the California Supreme Court reasoned that it was essential that the courts have a right to compel a refund, as a means of protecting the public against collusive contract awards without competitive bidding.

In another California case, a licensed prime contractor sought to enforce a mechanic's lien for work including that performed by an unlicensed subcontractor and for which the prime contractor had paid. But the lien was denied as to that work. One of the California District Courts of Appeal reasoned that the subcontractor could not have enforced a lien, and that the prime contractor, standing in the place of the subcontractor after paying him, had no better right to enforce a lien. (Holm v. Bramwell, 67 Pac. 2d 114.)

Sand pile collapses and kills trespassing child

THE PROBLEM: *Large sand and gravel piles and a conveyor belt were maintained by defendant company on unfenced premises near a roadway. A 10-year old boy, playing on one of the piles with other boys, suffocated when the sand pile collapsed upon him. Was the suit against the company improperly dismissed on the theory that a jury could not find out if the boy was excusably unaware of the danger of the pile collapsing?*

THE ANSWER: Yes. (Knight v. Kaiser Company, 305 Pac. 2d 248, decided by the California District Court of Appeal, First District, San Francisco.)

The court followed the reasoning of an Illinois court (244 Ill. App. 505) in a similar case involving the death of an 11-year old boy: Children are so commonly known to have an almost passionate fondness for sandpiles that accidents of this sort should be foreseen if children are not excluded from them.

The California court ordered reinstatement of the mother's suit for damages.

For more facts, circle No. 275→

Valid repair contract

THE PROBLEM: *In Illinois, a drainage district cannot validly contract for an improvement until the benefited land is assessed. A court ordered an assessment to be made, covering the cost of repairing ditches, after due notice to all parties concerned. The district then contracted for the repairs, before the assessment roll of benefits and damages was prepared and filed as required by Illinois law. Was the contract valid?*

THE ANSWER: Yes. (Wheatley v. Moredock & Ivy Landing Drainage District, 140 N. E. 2d 517, decided by the Illinois Appellate Court, Fourth District.)

The court suggested that public contractors check local laws before contracting, to be sure that the agreements are not so prematurely entered into as to be unenforceable.

No sales tax due on cancelled sale

THE PROBLEM: *The seller and the buyer of pipe agreed that credit would be given the latter for pipe returned. A then existing California statute exempted from sales tax money refunded to the buyer upon cancellation and return of property sold within 90 days. Pipe was returned within 90 days and credit given the buyer, but the return and credit were not noted on the seller's records until after the 90-day limit. The seller paid tax under protest. Was seller entitled to a refund?*

THE ANSWER: Yes. (Youngstown Steel Products Company of California v. State Board of Equalization, 306 Pac. 2d 983, decided by the California District Court of Appeal, Second District, Los Angeles.)

A list of coming conventions appears on page 65.

FOR MANUAL APPLICATION

THIS HARD-FACING ROD	FOR THESE CONDITIONS	FOR THIS EQUIPMENT	APPLI-CATION
VICTORTUBE	Severe abrasion	Ripper and ditcher teeth, dredge cutter blades, posthole augers, oil field tools, pug mill knives	ACETY. AC-DC ELEC.
VICTORTUBE BARE-30-DOWN	Severe abrasion	Agricultural tools	ACETY. ONLY
VICTORTUBE "SPECIAL"	Abrasion, severe impact	Oil field bits, rock bits	ACETY. ONLY
VICTOR TUNGSMOOTH	Thin cutting	Augers, bits, blades, screw conveyors, farm tools	ACETY. AC-DC ELEC.
VICTORITE	Earth abrasion, sliding friction	Farm tools, earthmoving rigs	ACETY. AC-DC ELEC.
TUBE VICTORITE	Abrasion, impact	Plow points and farm tools	ACETY. AC-DC ELEC.
VICTORITE 1	Corrosion, heat, abrasion	Chemical and food machinery, arbors, screw conveyors, soaking pit tongs	ACETY. AC-DC ELEC.
VICTORITE 6	Red heat, impact corrosion, abrasion	Forming dies, exhaust valves, cams, steam valves	ACETY. AC-DC ELEC.
VICTORITE 12	Heat, abrasion, impact	Saw blade inserts and other critical applications	ACETY. AC-DC ELEC.
VICTORITE CARBON ARC	High abrasion, thin deposit	Plowshares, lister shares, sweeps	CARB. ARC ACETY.
VICTORALLOY	Abrasion, severe impact	Crushers, dredge pumps and cutters, dipper teeth, tampers, rollers, idlers	ACETY. AC-DC ELEC.
VICTORALLOY #1	High abrasion, medium impact	Bucket lips, rock crushers, muller tires, gyratories	ACETY. AC-DC ELEC.
VICTORALLOY "A"	Angular shock, extreme impact, build-up	Clutch parts, gears, crusher plates, gyratory mantles, build-up for hardfacing	AC-DC ELEC. ONLY
VICTORALLOY "B"	Heavy impact, moderate abrasion	Tractor rollers and sprockets, shovel pads, plates, idlers, etc.	AC-DC ELEC. ONLY
VICTORALLOY "C"	High abrasion, moderate shock and impact	Tractor grousers, pressure rolls, crusher segments, roll crusher teeth	AC-DC ELEC. ONLY
VICTOR MULTI-PASS	Impact, compression, build-up	Drive sprockets and tumblers, rollers, idlers, churn drills, clutch jaws	AC-DC ELEC.

What's proper Victor rod for your hardfacing needs

THIS CHART GIVES YOU QUICK ANSWER

VICTOR for hardfacing

Use it to select right rods for prolonging operating life of your equipment. You'll be selecting rods that go on quickly and smoothly, thereby saving labor and downtime. Order from your Victor dealer TODAY.

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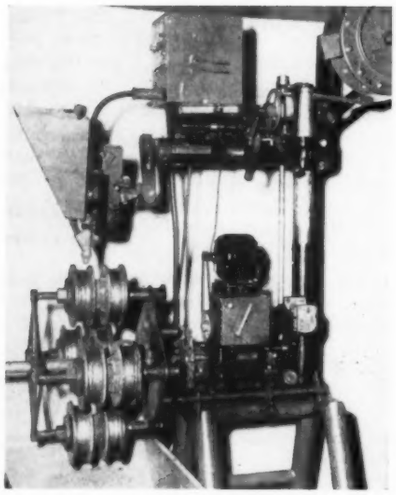
FOR AUTOMATIC & SEMI-AUTOMATIC APPLICATION

THIS TYPE	FOR THESE CONDITIONS	ON THIS KIND OF EQUIPMENT
#0	High abrasion, medium impact	Crusher rolls, rock crushing equipment
VA #1	Abrasion, medium impact	Crushers, scraper blades
VA #2	Abrasion, impact, Multi-pass application	Steel mill applications, tractor idlers
VA #3	Abrasion, light impact	Mill guides, crushers, dredge bushings
VA #4	Multiple layer build-up	Tractor rollers and idlers, sheave wheels
VA #5	Heavy impact, abrasion	Tractor rollers, idlers, mine car wheels, sheave wheels
VA #6	Medium abrasion, high impact	Crane wheels, drums, roll necks
VA #7	Abrasion, high impact	Build-up for hardfacing, mine car wheels
VA #8	Abrasion, high impact	Roll crushers, scraper and grader blades, tool joints
VT #60	Extreme abrasion	Tool joints, grader blades, scraper blades
Mo-Mn	Manganese build-up	Wherever manganese build-up needed

H-39

Multipurpose hardsurfacing machine does double duty in shop and field



The indexing fixture permits four tractor rollers to be mounted under the automatic submerged arc-welding head for hardsurfacing. To repair tractor idlers, the fixture is removed.

A portable hardsurfacing machine, which took two years to get off the drawing boards, is saving money for its inventor, Russell Lay, owner and operator of a small machine shop in Mt. Vernon, Ill. Since Lay's business covers a large territory, he wanted a machine that could hardsurface worn tractor rollers and idlers, and also be used in the field to build up deteriorated oil well tool joints.

The machine Lay invented is based on submerged arc welding combined with a chain-driven indexing figure which accommodates four rollers at a time. These rollers do not have to be of the same diameter. To handle the large idlers, the fixture is slipped off the central driveshaft, and cone holders are fitted over the shaft to bear against an idler and hold it securely.

A modified Lincoln ML-2 semiautomatic welding head is transversely driven through an 18-inch horizontal feedscrew. The feedscrew can be up or down to bring the electrode point squarely to the surface for treating. The machine assembly contains parts of Lincoln full automatic welders, plus many that Lay designed.

Flux is continuously deposited over the arc from the hopper on the welding head. A separate motor and speed reducer turns the top roller on the fixture as the bead is laid uniformly across the tread surface. The fixture is then indexed 90 degrees against a stop for processing the next roller. The entire fixture, as well as the frame and supporting members, are built up of arc-welded tubing, structural sections, plate, and bar stock.

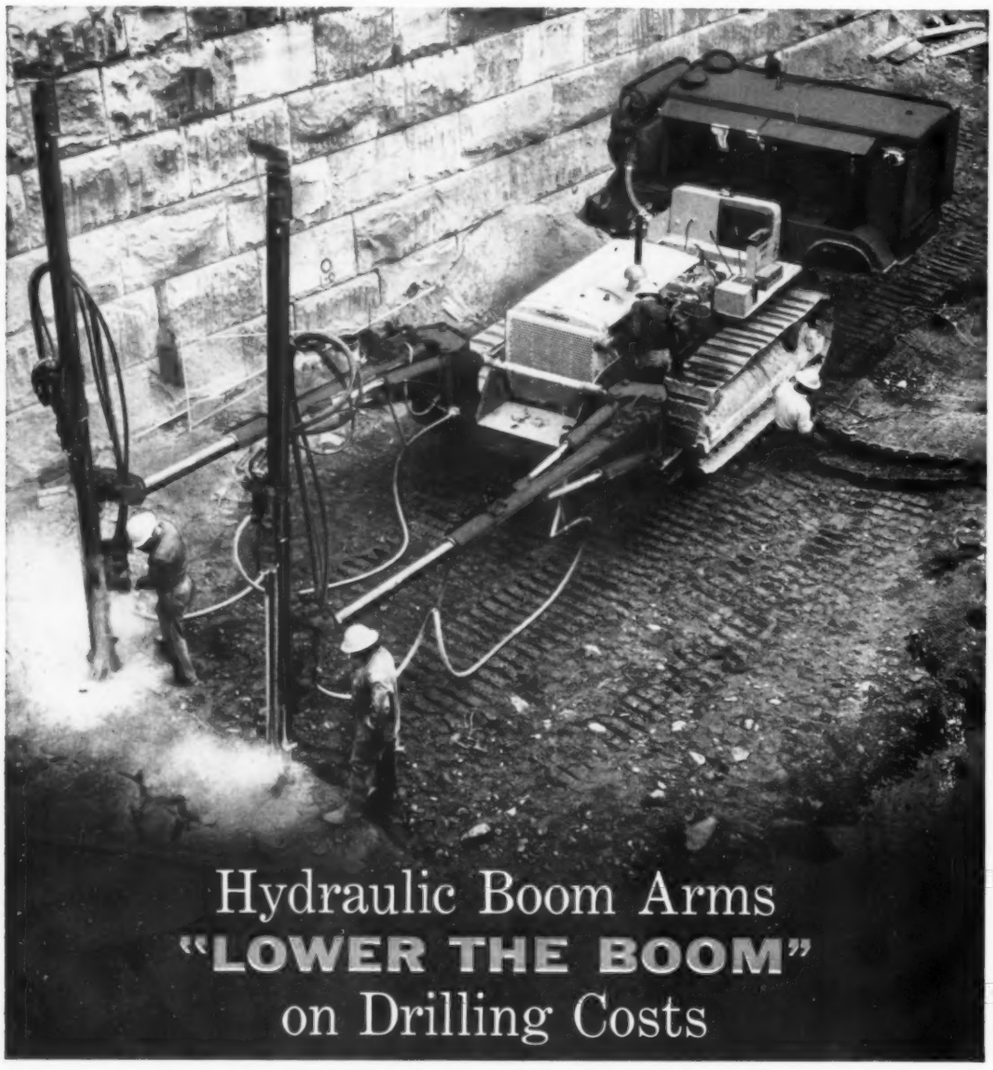
Alloy flux is applied on all surfacing jobs, with an electrode that is a standard L-60 mild steel wire of 3/32-inch diameter, carried on a reel mounted atop the machine. The metal deposited gains its hardness from ferro-alloys and carbon intermixed with agglomerated flux. When cooled, the metal, an alloy layer of 33 to 37 Rockwell C hardness, is obtained, which has abrasion and impact resistance 2½ times more than hot roller steel. Lay claims that the resurfaced roller probably will outlast a new one, and the cost of the operations is about ⅓ the price of a new roller.

Flux used on roller surfacing is H-535; on tool joints, it is changed to H-560, in order to boost the hardness to 53 to 61 Rockwell C. No change in wiring is necessary.

For field work, the machine is easily demounted and moved by truck to the site. When tool joints are serviced in the field, a universal chuck is mounted on the shaft to grip the 5¾-inch diameter part. A gasoline-engine-driven generator is used in the field; a motor generator in the shop.

The compact, maneuverable, and portable machine eliminates different types of electrodes for surfacing jobs. The indexing fixture takes less room than a single shaft that mounts several rollers in a line. This requires a longer beam for the welding head, usually a travel carriage, along with a great deal of more complicated controls which add to the cost.

THE END



H-Booms have extra-capacity, double-acting hydraulic cylinders that retract and extend, swing or elevate in a hurry—yet pressures are moderately rated. There's no creeping or drifting! Boom can be extended 6 feet . . . that's an extra foot of length to afford better spacing of holes and greater area coverage without moving the rig.

Heavy-duty, Chicago Pneumatic H-Booms can be easily mounted on mine car, track or rubber-tired jumbos. It's a highly productive drilling unit when used on your old tractor. Write for more detailed information. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

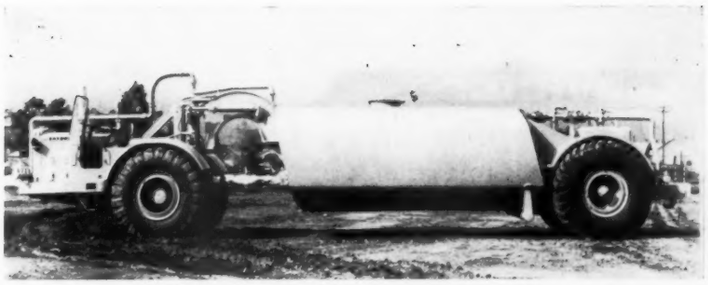
PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

For more facts, use Request Card at page 18 and circle No. 276

PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.

Recently introduced in this country, though for many years in wide European use, the **Benoto** EDF 55 deep caisson digging machine permits the simultaneous removal of the contents of the casing as it is forced into the ground. Earth is removed by a modified version of the grab or orange peel bucket. Vertical or battered shafts up to an angle of 15 degrees may be dug with equal ease. The machine is easily transported, and a special device permits it to move in any direction without tracks. Benoto, Inc., Dept. C&E, 224 S. Michigan Ave., Chicago 4, Ill. **Circle No. 183.**



A 6,000-gallon, semitrailer sprinkler tank is offered by the **Southwest Welding & Mfg. Co.** Designed for use with the single-axle Caterpillar DW21 tractor, the all-steel Model STT-60 trailer is 10 feet wide and 11 feet 10 inches high. Overall length of both tractor and trailer is 45 feet. The 1,500-gpm spraying pump is a 6-inch, self-priming, centrifugal type powered by a 6-cylinder gasoline engine. Construction Machinery Div., Southwest Welding & Mfg. Co., Dept. C&E, 3201 W. Mission Road, Alhambra, Calif. **Circle No. 185.**

Wagner Tractor, Inc., has in production 4-wheel-drive and 4-wheel-steering rubber-tire tractors easily converted to heavy-duty 50,000 or 65,000-pound compactors. Rubber-tire wheels and steel compaction wheels are interchangeable, affording a prime mover for use in compacting, dozing, towing a sheepsfoot or a self-loading scraper. Two models, IND-14 and IND-18, powered by 150 and 210-hp Cummins diesels respectively, are available. Wagner Tractor, Inc., Dept. C&E, 8027 N. E. Killingsworth St., Portland, Oreg. **Circle No. 186.**

A 600-hp diesel rear dumper for off-highway use is announced by **Autocar.** The AP-40 is engineered for 40-ton payloads with speeds up to 33 mph. It stands more than 13 feet high, with a length of 31 feet 10 inches, and is equipped with a 27-cubic-yard body. Power is supplied by a V-type, turbocharged 12-cylinder Cummins diesel, giving the truck a horsepower-to-weight ratio of 275 to 1. Autocar Div., White Motor Co., Dept. C&E, Exton, Pa. **Circle No. 184.**

Bulldozer blade can be tilted in four directions

The Tilt-Crown bulldozer blade that can be tilted 14 degrees to either side, as well as tipped 10 degrees fore or aft by hydraulic power applied directly from the operator's seat, is announced by the J. I. Case Co. For use with Terratrac tractors, the new feature is said to offer special advantages for such operations as ditching, road-crowning, cutting tree roots, and breaking-out hard ground.

The blade is activated by four large hydraulic cylinders. Two cylinders mounted on the dozer push arms control tilt and tip. The other two cylinders, trunnion-mounted on the tractor, exert down-pressure with the blade in any position, and also lift the blade 34 inches from ground level. Center-pivot mounting is said to make it possible to tilt the moldboard without twisting the tractor or track frame.

This new power-tilt feature is available on the new 80 and 100-hp Case-TerraTrac crawlers.

J. I. Case Co., Dept. C&E, Racine, Wis.

Circle No. 23.

Central Oregon Pumice uses this Hobbs-Schonrock 36-yard cable-dump trailer for continuous 5 to 8-mile hauls.

Cable-dump trailer unit cost-saver on long hauls

In 1948, W. E. Miller bought the assets of a nearly-defunct corporation engaged in a small-scale pumice aggregate business in Bend, Oreg. Today, the Central Oregon Pumice Co. is one of the nation's largest suppliers of pumice, a cellular volcanic material used mainly in lightweight building blocks and concrete.

The initial step in the development of the business was the rebuilding and complete modernization of the company. Miller then bought a Hobbs-Schonrock 36-yard cable-dump trailer to haul pumice from pit to processing plant, replacing four bobtail trucks formerly needed on the same haul. He acquired additional pumice land close to the plant and started looking for new volcanic products, uses, and markets.

When the company first purchased the Hobbs unit, there was some skepticism among the employees and others including one of his competitors, who called it a "monstrosity". Miller himself had considerable doubt as to the practicability of the unit. However, all those associated with it now are convinced that it is an economical unit and the answer for steady hauling outfits like Central Oregon Pumice, where continuous 5 to 8-mile trips are made daily. The driver claims he can put the unit places where he could not put a solo.

For further information on Hobbs-Schonrock cable-dump trailers, write to Hobbs Trailers, Dept. C&E, 609–33 N. Main St., Fort Worth 1, Texas.

Circle No. 72.

New abrasive blades cut "green" concrete

A new abrasive blade named Krete-Kut is being used for cutting concrete expansion joints on the new Texas Turnpike connecting Dallas and Fort Worth. The new blade, manufactured by the Bay State Abrasive Products Co., has been designed for use with any of the well known makes of concrete saws.

Flenniken Construction Co., Lake

SERVICISED

"BASEAL" rubber base plate

FOR CONCRETE PAVEMENT

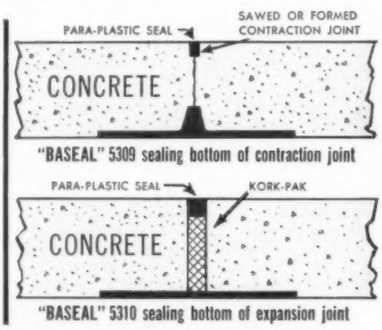
Keeps Water And Foreign Materials From Entering Joint At Bottom...

For maximum protection of expansion and contraction joints in concrete pavement, and the elimination of pumping action at joint intervals, be sure the *bottom* of the joint is protected against water seepage and the infiltration of foreign materials. Specify Servicised "BASEAL"—a resilient rubber base plate for expansion and contraction joints—made in two types, specifically designed for optimum performance and joint protection. "BASEAL" provides long-time protection because it is an extremely stable rubber compound, resistant to deterioration caused by fungus growth, etc.

Installation is simple. "BASEAL" is merely placed over the compacted pavement base prior to paving. Due to its resilient characteristics, the material will conform to the terrain after concrete is poured.

"BASEAL" is available in continuous lengths of 26 feet. Standard width is 6 inches.

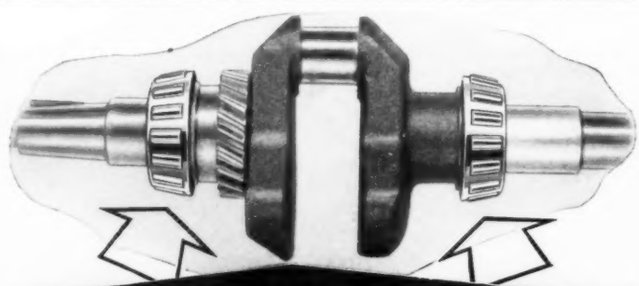
Drawings at right show Servicised "BASEAL" in place in expansion and contraction joints.



Write for the SERVICISED Catalog which illustrates and details Servicised products for highway and heavy construction work.

SERVICISED PRODUCTS CORPORATION
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 277

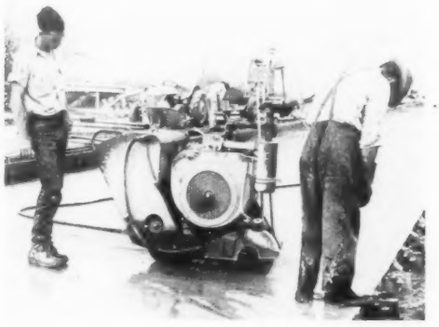


Tapered Roller Bearings
Support both ends of every
WISCONSIN ENGINE CRANKSHAFT

Main bearing failure is unheard of in Wisconsin Heavy-Duty Air-Cooled Engines even when operating under heaviest loads on continuous duty. The tapered roller bearings take end thrust and side-pull, and mount on a crankshaft that is drop forged for maximum strength and load carrying capacity. The strength of *bearings* and *crankshaft* contribute greatly to the rugged, long-term performance your Wisconsin Engine delivers. Write for service map S198 and list of distributors and service stations.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

For more facts, use Request Card at page 18 and circle No. 278



A Bay State Krete-Kut GC-2312 blade saws green concrete to a depth of 2 inches on the Texas Turnpike.

Charles and Shreveport, La., and L. H. Lacy Co., Dallas, Texas, were contractors in the construction of this turnpike. Bay State's Krete-Kut blades were used exclusively by these contractors for sawing the transverse joints while the concrete was "green."

Bay State claims that their experience on both highway and airport jobs has demonstrated low-cost performance, actual cost averaging 1½ cents to 6 cents per linear foot depending upon the depth of the joint and the aggregate used. The blades will efficiently cut all types of aggregates in green concrete, it is reported.

Cutting concrete in the green state makes possible the use of silicon carbide abrasive rather than diamonds in these blades. Compared to diamond blades, therefore, their initial cost is low. In addition, though designed for wet operation, these blades are said to suffer no damage if the water supply is interrupted momentarily—a common accident that can quickly ruin a diamond blade.

For further information on these abrasive blades, write to Bay State Abrasive Products Co., Dept. C&E, 15 Union St., Westboro, Mass.

Circle No. 178.

All-plastic safety hat resistant to heat, cold

The development of a new all-plastic safety hat is announced by General Textile Mills, Inc.

Available in two models, the GenTex 105 brimmed hat and the GenTex 205 peaked cap, the safety headgear is said to be constructed with a completely new plastic shell. In addition to exceeding all standard safety requirements for resistance to pressure, impact, combustion, and voltage, the newly developed plastic shell withstands violent extremes in temperature, and is especially useful in zero and subzero climates, according to the manufacturer.

The hat incorporates the GenTex suspension system, which provides comfort as well as protection and is said to be washable in commercial or home laundry machines.

General Textile Mills, Inc., Dept. C&E, 450 Seventh Ave., New York 1, N. Y.

Circle No. 54.

Auxiliary generator powered by engine

A heavy-duty electric generator for use with trucks and tractors to provide 115-volt single-phase ac power is announced by Electric Controls, Inc. Designed for both continuous portable auxiliary power and emergency power during service failures, the Electrol GenerAC will operate motors of up to 2 horsepower.

The suggested applications of the unit include operating electric tools and supplying gas, telephone, and similar service trucks when no convenient power service is available.

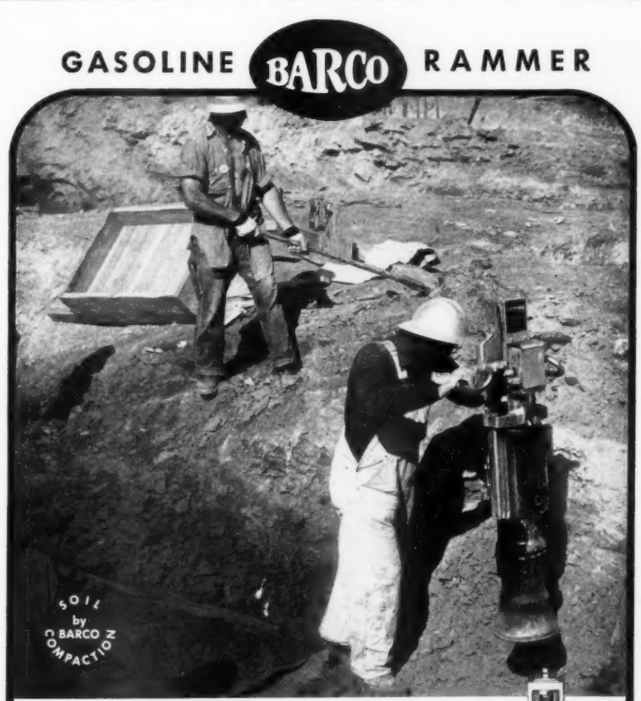
The GenerAC control panel is installed below the instrument panel of the truck or tractor. Load may be applied at the operator's discretion. The Model CD-3500 provides 3,500 watts of 60-cycle 115/230-volt single-phase electric power. A smaller model, the CD-1500, which provides 1,500 watts of power, is also available.

The GenerAC can be mounted on and driven by most truck and tractor engines.

Electric Controls, Inc., Dept. C&E, Wales, Wis.

Circle No. 33.

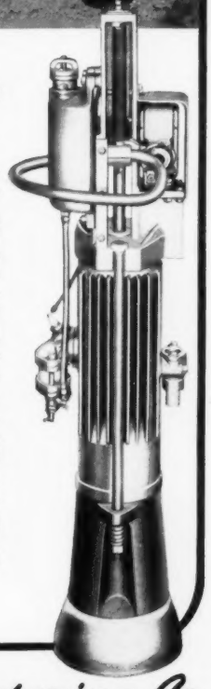
For more facts, use coupon, or Request Card at page 18 and circle No. 279



Barco Performance Pays Dividends!

Job Finished on Time!—When project specifications call for SOIL COMPACTION, Barco performance can't be beat! In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—RAPIDLY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches—on all kinds of construction jobs: Atomic Energy, Air Bases, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Bridges, Buildings, and Housing Developments. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

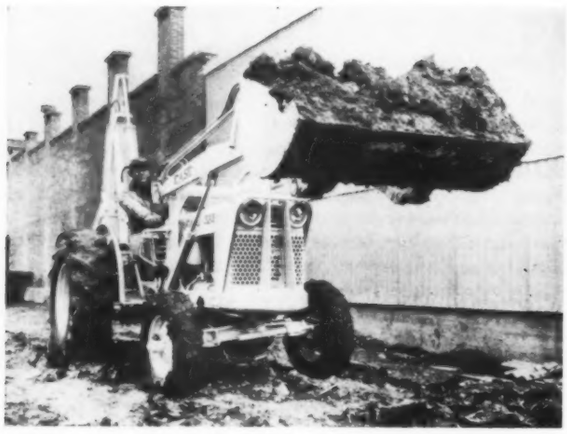
Ask for a Demonstration—We will be glad to arrange a demonstration for you; see our nearest distributor or write. SEND FOR A COPY OF CATALOG 621.



BARCO *Manufacturing Co.*

518H Hough Street • Barrington, Illinois

For more facts, use coupon, or Request Card at page 18 and circle No. 280



The J. I. Case Co.'s Model 320 wheel tractor features a special transmission that enables the operator to go in either direction without shifting gears.

Heavy-duty tractor has many new features

A new Model 320 wheel tractor is announced by the J. I. Case Co. The new tractor has recessed headlights and a steel bumper and radiator guard. Extra strength is provided by a fabricated steel wrap-around subframe, which protects engine and transmission and supports mounted equipment.

The tractor is powered by a high-torque 148-cubic inch Case industrial engine, with power steering and a new high-speed shuttle transmission also available. The special Case transmission enables the operator to go in either direction without shifting gears.

A seat that can be reversed for operating either the loader or backhoe is standard on all backhoe-equipped models. Both front-end loader and backhoe are of stress-engineered box-welded steel plate construction, with heavy reinforcements and replaceable hardened steel bushings at all points of stress, providing maximum strength with minimum weight.

An extra-large pump furnishes ample hydraulic power for both tools. The ½-cubic-yard loader bucket features automatic power leveling, 26-degree breakout angle, and 60-degree grading angle with twin-cylinder hydraulic control. Special backhoe features include the Case foot-controlled 180-degree swing, 18-foot 7-inch reach, 12-foot 6-inch digging depth, and telescoping hydraulic stabilizers. The backhoe can be quickly disconnected for using the loader alone.

J. I. Case Co., Dept. C&E, Racine, Wis.

Circle No. 24.

Adjusters set track tension hydraulically

Hydraulic track adjusters are being installed as standard equipment on both the 5-roller and 7-roller track frame arrangements of the Caterpillar D7 tractor, for use with the MD7 pipelayer, the Caterpillar Tractor Co. announces.

The hydraulic track adjusters used on this model pipelayer are said to be essentially the same as those currently being offered as standard equipment on the D7, D8, and D9 tractors.

Hydraulic adjusters on the D7 arrangement for the MD7 pipelayer reportedly allow track tension to be quickly and easily maintained, without the use of wrenches. According to the manufacturer, the only tool necessary for operation of the adjusters is an ordinary hand grease gun, with track tension being set by hydraulic pressure.

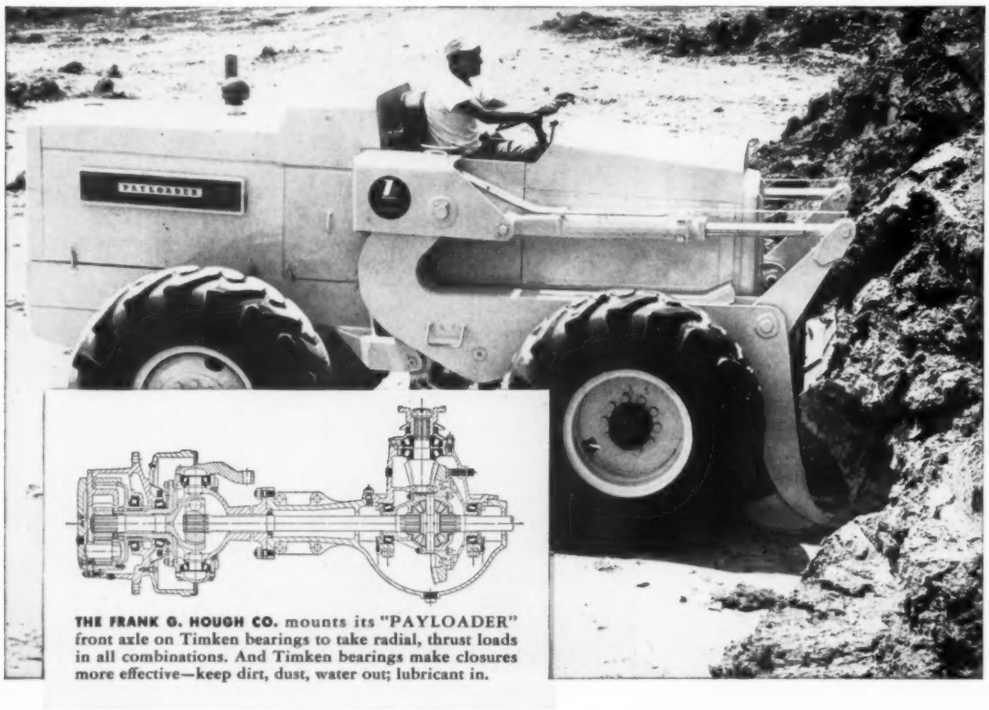
Caterpillar Tractor Co., Dept. C&E, Peoria, Ill.

Circle No. 92.

New hoist is announced for ¾, 1-ton trucks

A new hydraulic hoist, suitable for conversion installation on ¾ and 1-ton trucks, is announced by Hercules Steel Products Co.

Designed for use under Hercules light-duty dump bodies of up to 8 feet in length, platform bodies of up to 10 feet long, or 6½ to 9½-foot pick-up bodies, the new hoist is desig-



THE FRANK G. HOUGH CO. mounts its "PAYLOADER" front axle on Timken bearings to take radial, thrust loads in all combinations. And Timken bearings make closures more effective—keep dirt, dust, water out; lubricant in.

TIMKEN® bearings help give 21,000 lbs. of push—up to 50% more output

IN a powerful, highly maneuverable "bulk material handler" like this "PAYLOADER", manufactured by The Frank G. Hough Co., it's not pull that counts—but *push!* Timken® tapered roller bearings in transmission, front and rear drive axles, and wheels, help this dynamic unit exert up to 21,000 lbs. of sheer *shove* every time it tackles a pile of sand, gravel, cement, etc.

Axles are built by Wisconsin Axle Division of Rockwell Spring and Axle Company, with Timken bearings carrying the load in both differential and final drive. But aside from its tremendous power—the "PAYLOADER" does up to 50% more work than its predecessors. Timken bearings, because of full line contact between rollers and races, assure extra load-carrying capacity—and take heavy shock loads, because these same rollers and races are case-carburized to provide shock-resistant cores under hard, wear-resistant surfaces. The "PAYLOADER" works harder because Timken bearings work easier, under severe conditions!

Timken bearings take radial and thrust loads in any combination, because of their tapered construction. They're geometrically designed to give true rolling motion, practically eliminate friction. And they're precision-made to live up to their design. We even make our own steel, to assure highest quality. No other American bearing maker does this.

Look for "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD

TRADE-MARK REG. U. S. PAT. OFF.

For more facts, use Request Card at page 18 and circle No. 281

Hercules Model 440 twin-ram conversion hoist.

nated the Model 440. According to the manufacturer, the optimum capacity of the hoist is 6 tons.

The Model 440's dual-ram-type 4-inch cylinders are placed ahead of the truck rear axle. This provides peak hoisting efficiency, it is claimed. The new hoist has a dumping angle of 45 degrees and an 8 9/16-inch mounting height. It has been designed for installation on trucks having a CA dimension of 46 to 60 inches, with kick-up or straight frames.

Oil reservoir, manifold, remote control valve and PTO-driven pump are unit-mounted on the hoist subframe. Hoist operation is completely controlled from the truck cab. The slide-type control valve and high output dual-shaft pump are said to assure precise hoist control and rapid lifting.

Hercules Steel Products Co., Dept. C&E, Galion, Ohio.

Circle No. 42.

Offer pre-bid surveys of work site conditions

A pre-bid investigation service designed to help contractors determine local conditions and supply sources prior to submitting a bid is offered by American Cyanamid. According to the company, the service can save the contractor considerable time and eliminate much of the possibility of blind bidding.

On a highway project, for example, American Cyanamid investigators will locate the route and all local and supply roads; assemble information on core borings, material classifications, and the local availability and prices of materials; and locate subcontractors for the specialized phases of the job. The availability of borrow pits will also be determined.

When the contractor or his estimator is prepared to go over the job site, American Cyanamid investigators meet him at the site and accompany him over the work area.

According to the company, a further advantage of the pre-bid investigation is that it often aids the contractor in obtaining good drilling and shooting methods and results once the job has begun.

Explosives Dept., American Cyanamid Co., Dept. C&E, 30 Rockefeller Plaza, New York 20, N. Y.

Circle No. 75.

Portable aggregate bin for low-cost batching

Its new Model C Twin Bin for low-cost aggregate batches is announced by Cimco. Designed to handle two aggregates in batching stationary or small truck mixers, the Twin Bin comes either unmounted or mounted on wheels to pull at highway speeds of 30 to 40 mph. On the mounted Model CW, wheels and axles can be removed on the job if desired.

Besides its time-saving value through a constant flow of materials to the mixers during each mixing cycle, the larger storage capacity of the Model C offers extra low-cost convenience to ready-mix plants furnishing service to remote areas or contractors with stiff pouring schedules to meet, the manufacturer claims.

Other features include side and forward weighing hopper movement, said to give the operator easier control of the load. New designs also allow the hopper to move much farther out over the mixer skip or conveyor hopper to dump the load.

Cimco, Dept. C&E, Box 422, Marshalltown, Iowa.

Circle No. 43.

In Sandy Clay...

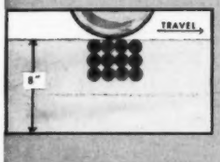
Contractor Compacts 18" Lift in 2 Passes!

JOB: 12 mile sector of Four-Lane State Highway
SOIL: Sandy Clay
MOISTURE CONTENT: 8%
DEPTH OF LIFT: 18 Inches
COMPACTION CONTROLLED BY: State Highway Engineers
COMPACTION SPECIFIED: 95% Modified Proctor
COMPACTION OBTAINED: 100-102% Modified Proctor
NUMBER OF PASSES: 2
SPEED: 2½ M.P.H.
COMPACTION COST: Approximately 2¢ per cu. yd.

VIBRATORY COMPACTION DID THE JOB!

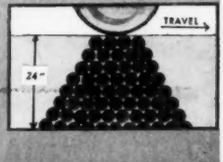
VIBRO-PLUS VB TERRAPAC

The job described above is routine, designed to take full advantage of the "Terrapac" vibratory roller . . . The specs permitted the contractor to put down any lift he desired as long as he met the density requirements set-up by the State. The "Terrapac" CH30 enabled the contractor to put down one 18" lift, where at least two would have been required with a static roller . . . "Terrapac's" exclusive vibratory method permitted higher lifts than is permitted when static rollers are to be used — then compacts faster, better and deeper *in fewer passes* . . . A "Terrapac" weighs only 3½ tons yet outperforms ordinary 30-50 ton static rollers . . . Light weight permits use of small, rubber-tired tractors to keep hourly operating costs DOWN! . . . Ask your Vibro-Plus distributor for a demonstration — see what dynamic vibratory compaction can do for you on your own job!



CONVENTIONAL STATIC COMPACTION
Rollers relying on weight alone provide friction forces between soil particles that prevent densification at any great depth.

TERRAPAC DYNAMIC COMPACTION
Vibratory forces, transmitted to soil in all directions, reduces friction — facilitates relocation of particles at greater depths.



VIBRO-PLUS PRODUCTS, INC. • STANHOPE, NEW JERSEY
WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES! AD NO 41-32

For more facts, use Request Card at page 18 and circle No. 282

The Henry backhoe sets its main frame right on the earth, putting the entire digging weight on the ground rather than on the tractor itself.

Outriggers ease backhoe burden on tractor

The Henry Super C-10H hydraulic backhoe is now available for use with the International Harvester 130 tractor.

Said to be particularly suited for use with this tractor because of its ground-gripping feature, the Henry backhoe sets its main frame right on the earth, putting the entire digging weight on the ground rather than on the tractor itself. The main frame is raised and lowered hydraulically. Available with either hydraulic or manual outriggers, the Henry makes 9 feet of ground contact.

The Henry boom swings in a continuous 160-degree arc without the necessity of resetting pins. It will dig from any angle within that arc, and can easily swing a load to either side of a wide ditch, according to the manufacturer.

Sixteen bucket sizes are available with the Henry, ranging in widths from 12 to 38 inches.

Henry Mfg. Co., Inc., Dept. C&E, 1700 N. Clay St., Topeka, Kan.

Circle No. 180.

Liquid agent cleans metal, concrete surfaces

A liquid cleaning agent for machinery and surfaces heavily soiled with grease or oil is available from the Dasco Chemical Co., Inc. Called Dasnex, the solution is said to eliminate the old-fashioned method of cleaning machinery and equipment. Easy and economical application are among the features stressed by the manufacturer.

Dasnex, it is reported, effectively penetrates through pores of concrete to remove imbedded oil and grease. The product is non-toxic and, according to Dasco, will not remove paint.

Dasco Chemical Co., Inc., Dept. C&E, 1602 Thames St., Baltimore, Md.

Circle No. 56.

Offer dig-in end blades for earthmoving machine

New dig-in-type end blades for bulldozers and angledozers are available from Paper-Calmenson & Co.

Made of high-tensile abrasion-resistant steel, the dig-in ends are shaped to bite into hard, crusted formations, easing the way for the main cutting edge. The formed point rolls the dirt to the center of the dozer and holds it there so more yards can be pushed, according to the manufacturer.

Blade Dept., Paper-Calmenson & Co., Dept. C&E, County Road B and Walnut St., St. Paul 8, Minn.

Circle No. 76.

New pre-cleaning filter for off-the-road units

An intake air filter designed as a pre-cleaner for use with oil bath filters on diesel and gasoline engines of heavy off-the-road equipment is announced by the Dollinger Corp.

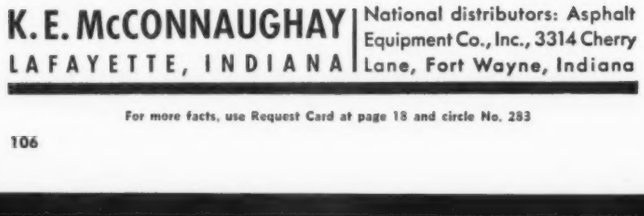
The new filter is said to substantially reduce maintenance costs and insure longer life for engines on equipment such as scrapers, bulldozers, and trucks.

According to the manufacturer, the pre-cleaner uses a dry-type filter medium, Feltex 40, which is 99.7 per cent efficient in stopping dirt that would pass through conventional oil bath cleaners to the rings, pistons,

LOW COST PRODUCTION
OF BITUMINOUS PAVING MIXTURES

McConnaughay Mixers are setting records for hot or cold patching and small resurfacing jobs *in any season!*

WORKING right on location, McConnaughay HTD Mixers are setting remarkable records for low cost production of bituminous paving mixtures... used for hot or cold patching and small resurfacing jobs in any season. Illustrated above is a Model HTD-500 at work on a street patching job. It provides the exact amount of material needed for fast, easy work with a small crew. Important, too, McConnaughay HTD models effectively remove both moisture and solvents from bituminous mixtures... patches and resurfaced areas set up hard as soon as the applied mixture cools. Write, wire, or 'phone for details and specifications today.



K. E. McCONNAUGHAY
LAFAYETTE, INDIANA

National distributors: Asphalt Equipment Co., Inc., 3314 Cherry Lane, Fort Wayne, Indiana

For more facts, use Request Card at page 18 and circle No. 283

Most Reliable Connections... for Your Suction and Water Hose

"KING" SHANK COUPLINGS

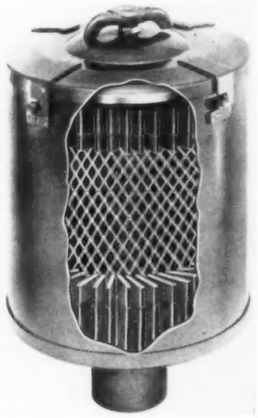
Strong, durable couplings with a reputation for long, reliable service among Contractors and other users of suction and water hose. Although built to take severest on-the-job punishment, they have refinements which contribute to outstanding efficiency and ease of handling . . . absolute uniformity in quality, threading and dimensions . . . well defined, smoothly finished corrugations.

Made in regular and heavy patterns, in all-malleable iron, plain or plated; all-brass; and malleable iron, plain or plated, with brass swivel nut. Sizes range from 1" to 8", inclusive.

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO. Associate Companies:

For more facts, circle No. 284



and cylinder walls.

Installation is said to be quick and easy. Maintenance is performed by blowing off the filter daily with compressed air.

Of simple three-piece construction, the filter has heavy-gage steel housing. A sponge-rubber gasket prevents dirt from leaking between the bottom of the cartridge and the housing. The cartridge, a dry-type felt filter medium, is completely sealed off at the top to prevent dirt leakage around the medium. The lid, which locks tight, is said to be quick and easy to open.

Dollinger Corp., Dept. C&E, 11 Centre Park, Rochester 3, N. Y.

Circle No. 117.

Dump bodies designed for rugged work

Three new heavy-duty Speedlift dump bodies, the Series 804, 940, and 1040, have been announced by the Daybrook Hydraulic Division of L. A. Young Spring & Wire Corp.

Built for rugged operations, these excavator-style bodies, with box-type side braces, are designed for loading, hauling, and dumping large stone, boulders, broken concrete, and similar loads requiring bodies of special strength and durability.

These Daybrook dump bodies feature sloping running boards, tailgate horizontal bracing, and bottom structural channel for the prevention of dirt or stone accumulation during loading operations.

All 23 models of the three series have reinforced, heavy-duty understructures; full-height corner posts; improved design; double-acting tailgates, said to be 50 per cent stronger with practically no increase in weight; a choice of heavy-duty hardware; and a new, improved method of adjusting tailgate spreader chains.

Daybrook Hydraulic Div., L. A. Young Spring & Wire Corp., Dept. C&E, Bowling Green, Ohio.

Circle No. 11.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

For more facts, circle No. 285

One man operates new traffic-line remover

Among advantages claimed for the new Cyclone traffic-line remover is that one man is in entire control of the operation. With most larger equipment, two men are needed since a man must be stationed to shut off the equipment, the company points out.

The new unit is said to be pushed as easily as a shopping cart. When used in traffic, the sand does not fly from the machine to such an extent as to obscure driving vision; even pedestrians are not bothered, it is claimed. No excessive sand deposits are left that need to be cleaned up.

The equipment erases about a foot a minute of average worn highway line. While it is particularly adapted to repair jobs, it has also been used on big jobs.

Cyclone Sandblast Equipment, Dept. C&E, 42 Clara St., San Francisco 7, Calif.

Circle No. 171.

◄ The Cyclone traffic-line remover erases about 1 foot of worn highway line per minute.

top performer . . . *with straight or arched boom*

Whether your preference is for a straight or arched boom, you can put Insley's proven design characteristics and dependability to work for you. An Insley is easy to service, simple to maintain, and always ready for the tough jobs, day after day. Insley is fully convertible for hoe, shovel, dragline, clamshell and cranework, and is available with gasoline or diesel power.

See your Insley distributor for more details or write direct to Insley.

INSLEY MANUFACTURING CORPORATION · INDIANAPOLIS, INDIAN

Using a 7¼-pound hydraulic fastening tool, a workman prepares to drive a Huckbolt fastener to join a gusset casting to an aluminum panel.

New fastener speeds auditorium assembly

Complete erection of an aluminum dome auditorium in just 23 on-the-job working hours was made possible by the use of a new fastening process. The Huckbolt fastener, a rivet-type lockbolt manufactured by Huck Mfg. Co., Detroit, is said to provide a new, time-saving assembly method.

The geodesic dome, which provides an auditorium facility for a new resort village at Waikiki, Hawaii, is 48 feet high and 152 feet in diameter. It consists of 575 diamond-shaped cambered panels of varying length (9 to 11 feet) which are joined to form a rigid, high-strength spherical shell. More than 19,000 Huckbolt fasteners were used to join the panels.

The Huckbolt fastener is reported to fill the fastening hole, pull adjoining metal surfaces together, and to have approximately one-half the weight of a bolt and nut of similar material. Consisting of a pin and collar made to close dimensional tolerances, the unit is very rapidly installed.

A hydraulic fastening tool pulls the pin, and the collar is swaged into locking grooves. Tensile preload is built into the fastener, and when tension is just right, the pin automatically breaks flush with the collar at the breakneck groove provided in the fastening design.

Whereas erection engineers had predicted a 5-day erection schedule, the entire operation required only 23 field hours with the new method.

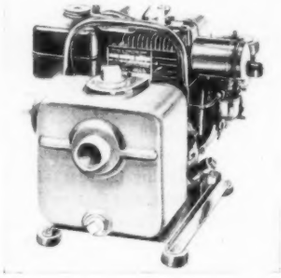
For further information about this time-saving fastening method, write to the Huck Mfg. Co., Dept. C&E, 2480 Bellevue Ave., Detroit 7, Mich., or use the Request Card at page 18.

Circle No. 176.

New centrifugal pump needs no check valve

A new concept in the design of self-priming centrifugal pumps has been announced by Midland Products Co.

The new design eliminates the need for a check-valve. In older self-primers, the priming liquid was frequently lost due to a leaky check-valve. The new Midland pumps



reportedly cannot accidentally lose their priming liquid. The advance in pump design is made possible by a new priming method that is not only fast in priming, but prevents any sand from settling in the pump case, according to the manufacturer.

The new design also incorporates a volute cast separately from the main body. This means the volute can be of iron for wear resistance and easy replacement, while the body is of aluminum for lightness.

The new Midland pumps are available in 1½ and 2-inch sizes, with ratings of 5,000 and 7,000 gph, respectively.

Midland Products Co., Dept. C&E, 181 Greenwood Ave., Midland Park, N. J.

Circle No. 179.

CONTRACTORS! *Booming business and dud prospects don't go together . . . knowing where the "live ones" are—that's what you need!*

Write for a better way to make your profits go up

Advance information about new projects makes the difference between boom and bust when you do business with the construction industry. Dodge Reports not only give you early notice—they help you follow through by telling you whom to contact and when the job is out for bids (even who's bidding) on just the kind of work you want. If you'd like to know how to pin-point the "live" prospects that will help make your profits rise, just read and mail this coupon today.

TO: **DODGE REPORTS**, DEPT. 75, 119 WEST 40th STREET, NEW YORK 18, N. Y.

Yes! I'd like to pin-point my prospects by knowing in advance who's going to build, what, when, where.

I want to know whom to contact and when to submit bids.

I'd like to see some Dodge Reports, and I'd like a copy of your booklet that tells how to use this accurate, daily, up-to-the-minute construction news service.

I understand that I can pick just the area in the 37 Eastern States and the type of construction activity that interests me. Also, that I won't have to wade through mounds of data to find the information I need.

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in the Following Area: _____

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ADDRESS _____

CITY _____ ZONE _____ STATE _____

Dodge Reports
For Timed Selling to the Construction Industry

For more facts, use Request Card at page 18 and circle No. 286

The entire operation of loading the Middlestadt Machine Co.'s Model FJM-5115 melter and feeding the melted compound into the joints can be accomplished by one man.

Costs shaved by new pressure-sealing melter

The Model FJM-5115 melting kettle for the pressure-sealing of concrete joints is available from the Middlestadt Machine Co. The melter is an indirect-fired, oil-bath type, with a capacity of approximately 100 gallons. A gasoline-driven agitator is employed.

The total heating-up time required to produce the unit's specified melting rate of 30 gallons per hour is not more than 2 hours, the manufacturer states.

An airmotor 12 to 1 ratio pump is used to force the filler compound through a flexible stainless steel hose connected to the manually operated sealing unit. The entire operation of loading the melter and feeding the melted compound into the joints can be accomplished by one man.

At a recent demonstration of the machine on a new runway at Stewart Air Force Base, Newburgh, N. Y., the pours made proved to be fast, neat and fully penetrating.

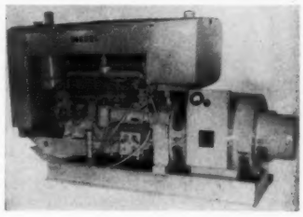
The Middlestadt Machine Co., Dept. C&E, 4210 Chesmont Ave., Baltimore 6, Md.

Circle No. 181.

Diesel-powered generating sets range up to 35 kw

A complete line of diesel-powered generating sets is announced by the Universal Motor Co. The units are available in sizes ranging from 10 to 35 kw. Revolving field-type alternators with directly connected excitors are used on all models. The units are available in either single-phase or three-phase, for 2, 3, and 4-wire applications, and in all popular voltages.

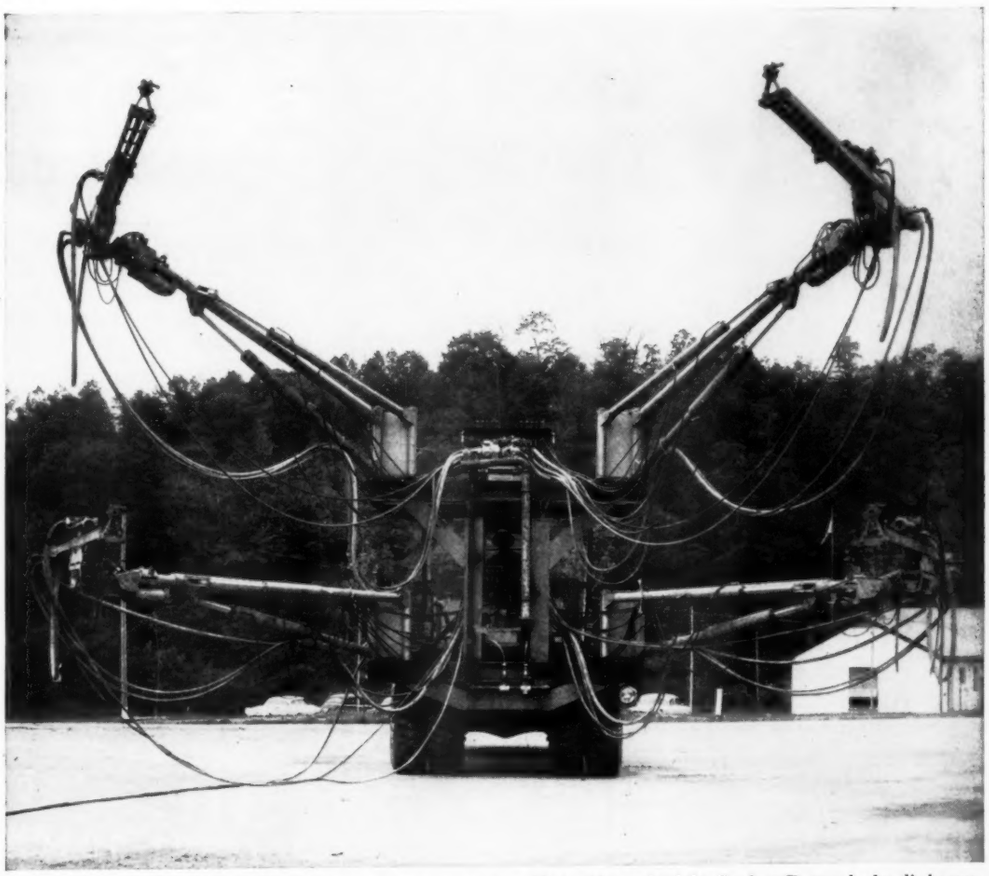
Standard equipment on all models includes mounted engine instruments, mounted generator instruments, automatic voltage regulator, rheostat, fuel tank, and electric starting.



Optional starting controls and accessories for special installations are available.

Universal Motor Co., Dept. C&E, 428 Universal Drive, Oshkosh, Wis.

Circle No. 27.



Head-on view of a 4-boom jumbo. Note wide reach of the Gardner-Denver hydraulic booms.

THE ROLLPAC

QUICK DETACHABLE EDGER WHEEL, OPTIONAL

$895.00

A Standout One Ton Roller in worldwide use by Contractors, Paving Engineers and Institutions.

Ask To See It.

ROLCOR Industries
1208 2nd Ave. So. Minneapolis 3, Minn.

For more facts, circle No. 287

Build your own jumbo with

GARDNER-DENVER COMPONENTS

Tailor your truck, tractor or rail mounted jumbo with Gardner-Denver booms, feeds and drills. You get just what you need for each dollar invested. Gardner-Denver offers a wide selection in:

- **HYDRAULIC BOOMS,** completely automatic and remotely controlled for mounting on your jumbo.
- Manufactured in two sizes and types (tunnel and rugged types), TRIPODS for mounting heavier drifter equipment with the longer chain feed.
- **POWERFUL ROCK DRILLS** in 3-, 3½-, 4 and 4½-inch sizes. Long chain or screw feed mountings.
- **SECTIONAL DRILL RODS** and couplings for long-hole drilling. Gardner-Denver Ring Seal Shank.
- **REMOTE CONTROLS** located at any point along the boom or on the jumbo chassis. With G-D Remote Controls, one operator moves booms into position and controls complete drilling operation without leaving his station.

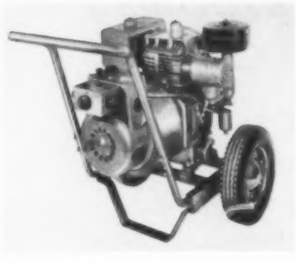
Gardner-Denver engineers will work with your staff and powderman to design your jumbo to the job.

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
Gardner-Denver Company, Export Division, 233 Broadway, New York 7, New York
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

For more facts, use Request Card at page 18 and circle No. 288



The Model BHA-20LD generator.

New portable generator has 2,300-watt output

Its Model BHA-20LD portable electric generator is announced by Pioneer Gen-E-Motor Corp. Powered by a Briggs and Stratton engine, the unit is said to produce 2,300 watts at 115 volts ac. For battery charging, it provides 12 volts dc at 200 watts, according to the manufacturer.

A standard feature of the 60-cycle, single-phase generator is an automatic cutout designed to prevent overcharging and causing serious damage to the battery.

The frame is mounted on large, rubber-tire wheels, though a tubular skid may be substituted, if desired.

Pioneer Gen-E-Motor Corp., Dept. C&E, 5841 W. Dickens Ave., Chicago 39, Ill.

Circle No. 98.

Track pin press for small crawlers

The OTC track pin press for small crawler tractors.

A track pin press designed to press and replace track pins and remove and replace bushings without removal of the track shoes has been announced by the Owatonna Tool Co.

The steel frame and ram assembly mounts on a steel base, but can be removed for transportation to the field for on-the-job repairs or overhaul of track.

A 35-ton two-way single-cylinder OTC ram does the pushing. A full 7¼-inch stroke assures complete removal in one pushing cycle, according to the manufacturer. Adaptors for each operation snap into the ram head so that changes can be made quickly. To facilitate handling of the track, roller conveyor 5-foot sections may be added.

The press requires a floor space of 16×40 inches without the conveyors. It stands approximately 32½ inches high and is available with hand, gas, or electrically-operated pumps. A handy finger-tip valve is furnished for control, and a hydraulic pressure gage is mounted at eye level.

Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn.

Circle No. 168.

Reel for reserve cable supply on bulldozers

A cable reel to provide a reserve supply of cable in operating the Caterpillar Nos. 9A, 9S, 8A, 8S, and 8U bulldozers is announced by Caterpillar Tractor Co.

Designed to mount conveniently on the side of the radiator guard, the cable reel provides storage space for 300 feet of cable. Should the cable break, the reserve cable may be readily reeved through the cable control sheaves to replace the broken portion.

Use of the cable reel eliminates discarding the full length of cable required to operate the bulldozer, according to the manufacturer.

Caterpillar Tractor Co., Dept. C&E, Peoria, Ill.

Circle No. 99.

yes sir... we can fill your order immediately!

men of the highway construction industry know they can depend on . . .

ONE DEPENDABLE SOURCE FOR...

SEALTIGHT® PRODUCTS FOR BETTER CONSTRUCTION

- Expansion Joints; Premoulded Asphalt, Fibre, Corkfill, Sponge Rubber, Plain Cork and Self-Expanding Cork Types.
- Tongue and Groove Centerstrip.
- Dummy Joints.
- Hot and Cold Pour Rubber-Asphalt Seal.
- Hot and Cold Pour Jet-Fuel Resistant (JFR) Joint Seal.
- Concrete curing compounds (clear and white Pigmented types)
- Air Entraining Agent.
- "PREMOULDED MEMBRANE" Vapor Seals
- "HYDROMAT" Asphalt Liners
- "DURA JOINT" Waterstops.
- Plus many other paving and building products.

W. R. Meadows Inc., the leading manufacturer of asphaltic products for over 30 years, and their distributors and dealers, located just about everywhere, offer you a complete line of top-quality, in-stock paving and building products. Order from one dependable source . . . you will save time, handling, and money. Eliminate the necessity of stocking lesser-used items . . . buy only what you need. Enjoy big savings by ordering mixed carload lots. For prompt service and expert engineering assistance you can rely on W. R. Meadows and their line of top-quality SEALTIGHT Products. Send coupon today for complete information and the name of your local SEALTIGHT distributor.

Write today for complete information.

SEALTIGHT® PRODUCTS FOR BETTER CONSTRUCTION

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Gentlemen:
☐ Send my copy of your Sealtight Paving Products Catalog.
☐ Have representative call.
NAME_____TITLE_____
FIRM_____
ADDRESS_____
CITY_____STATE_____

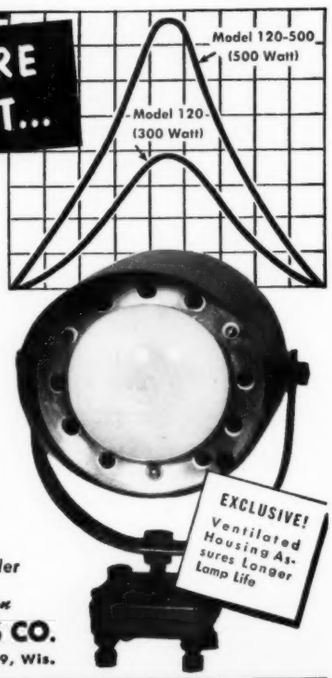
For more facts, use coupon, or Request Card at page 18 and circle No. 289

GET 59% MORE LIGHT OUTPUT...

From Model 120 500 Watt

STURDILITE FLOOD LAMP

- Steps up night-time production —
- Adds to SAFETY! . . .
- Especially Adapted for Operations Such as Open Pit Mining, Stripping, Dredging, Excavating, Crushing and Mix Plants, Logging, Road Building, Drilling, Quarrying, Etc.



WRITE For Illustrated Folder

Metal Spinning Division
PHOENIX PRODUCTS CO.
4727 N. 27th St. • Milwaukee 9, Wis.

For more facts, use Request Card at page 18 and circle No. 290

Batch tripping mechanism mounted under body floor

A new hydraulic batch tripping mechanism is announced by Hercules Steel Products Co.

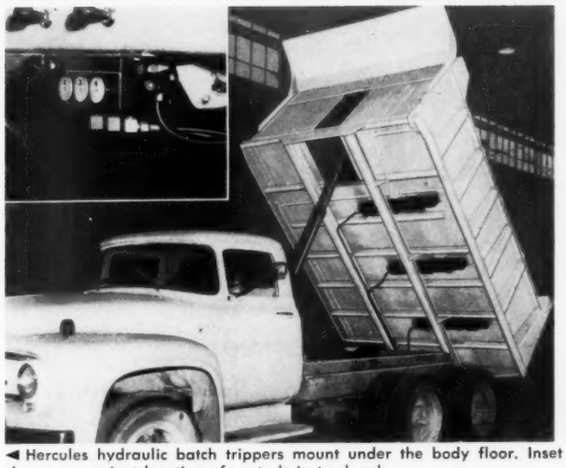
Hydraulic tripping units, one for each partition, mount under the truck body floor and are completely confined within the depth of a 4-inch crossmember. A compact valve manifold, installed under the truck dash, is used by the driver for releasing and relocking the batch partitions. Manifold and tripper units are connected by one-piece flexible lines to minimize possibility of leaks, Hercules reports.

The trippers are powered by the regular hoist pump. A diversion valve, lever-operated from the truck cab, directs hoist pump output to the trippers or the hoist. The hoist holds at any position when the diversion valve is switched to tripper operation.

The trippers are center-mounted under the partitions to prevent binding, with the operating mechanism offset from the lock opening in the floor to avoid clogging with cement or fine aggregate. Cab controls are identified by number, and knob position indicates partitions tripped, to prevent double-batching.

Hercules Steel Products Co., Dept. C&E, Galion, Ohio.

Circle No. 90.



◄ Hercules hydraulic batch trippers mount under the body floor. Inset shows convenient location of controls in truck cab.

Portable screw conveyors for moving materials

Two portable screw conveyors are available from the Baughman Mfg. Co.

According to the manufacturer, the new Q-52 Porta Loader can deliver various types of free-flowing material at rates of up to a ton per minute, with no need for tie removal or pits when unloading freight cars.

The firm's Q-53 Porta Loader has a conveyor that is extendable from 30 feet to 60 feet. Available as an accessory for the Q-53 is a special hopper attachment designed for unloading dump trucks.

Both the Q-52 and Q-53 can be used with a self-feeding flat storage screw attachment designed to work itself into materials stored in any flat area. Both models are available with either gasoline or electric motors.

Baughman Mfg. Co., Dept. C&E, 192 Arch St., Jerseyville, Ill.

Circle No. 102.

GOT THIS?

(Predraining Problem)

GET THIS!

(Skilled Wellpoint Engineering)

From

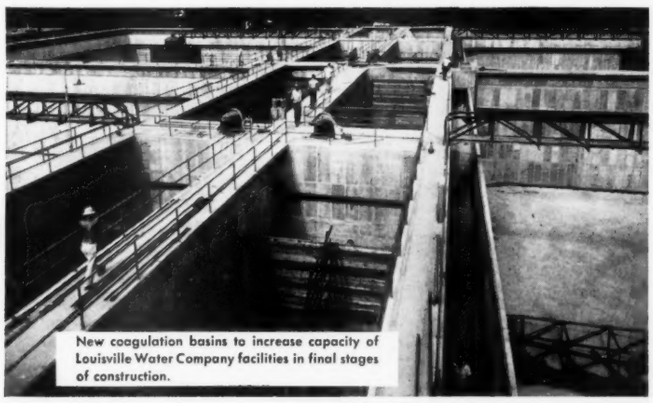
GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

For more facts, circle No. 291

How Pre-Fab Forms Saved Time, Material On Water Plant Job



New coagulation basins to increase capacity of Louisville Water Company facilities in final stages of construction.

Contractor Forms 200,000 sq. ft. contact area with 14,000 sq. ft. of panels

Forming a 350′ square water basin with exterior and interior walls 31′ high presents no problem to the experienced contractor. But, when the job must be done in minimum time at lowest possible cost to meet tough pouring and finishing specifications, careful planning and operation are required.

When the Henry G. Bickel Company and the Charles A. Connel Company were awarded the contract for the massive Louisville Water Company coagulation basins at Louisville, Kentucky, they selected the Uni-Form Panel System to form the 200,000 sq. ft. of contact area the job required.

Forming started fast, because the Uni-Form Panel System is ready to use when it reaches the job. Valuable time, labor and material savings were made because Uni-Form Panels require minimum alignment and bracing on 1 side only. The Uni-Forms were assembled and locked into a tight, rigid form with Uni-Form Ties supplied in exact lengths to provide automatically accurate thickness of both battered and straight walls.

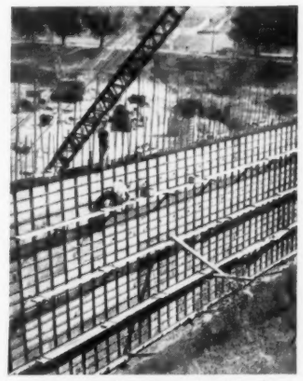
One side of the form was erected, permitting easy, unhampered placement of reinforcing. Since specifications did not permit the use of chutes or tremies, pouring pockets were provided as the forms were closed to maintain positive control of concrete placement.

Fast erection and stripping features of the Uni-Form System enabled the contractor to form the entire 200,000 sq. ft. of contact area with only 14,000 sq. ft. of Uni-Form Panels. Panels were used an average of 14 times without the necessity of maintenance or repair.

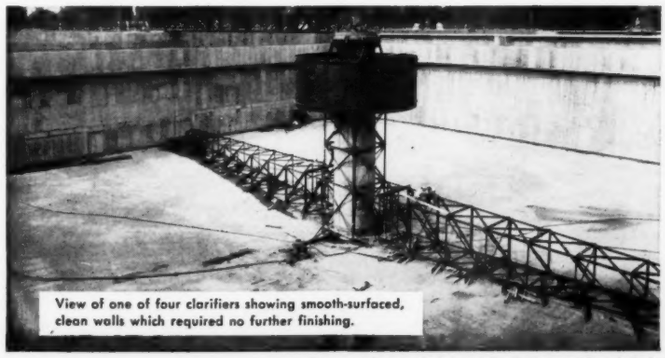
The simplicity of the Uni-Form Panel System, together with the services provided by Universal Form Clamp Co., insured fast job progress and satisfactory completion under the capable supervision of Harry Hunter, Supt.

Uni-Form Panels are versatile, high speed forming tools. They're used by the country's most successful contractors to form every conceivable type of construction. They are rented or sold. Universal Distributors and Branches are located from coast to coast. Write for Uni-Form Catalog and complete details on Uni-Forming—the modern way to form concrete.

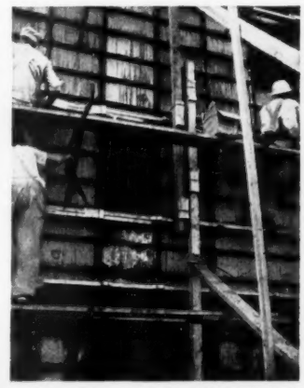
UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue • Chicago 51, Ill.



Section of exterior battered wall 31′ high, showing Uni-Forming nearly complete. Uni-Form Scaffold Brackets replaced costly conventional scaffolding systems.



View of one of four clarifiers showing smooth-surfaced, clean walls which required no further finishing.



Pouring pockets permitted specified control of concrete placement.

For more facts, use Request Card at page 18 and circle No. 292

Mounted on the International 130, the Shawnee D-65 backhoe is a complete unit containing all necessary hydraulic attachments.

New backhoe has 15-foot reach, digs to 9½ feet

A backhoe similar to a scaled-down version of the firm's Scout model is offered by the Shawnee Mfg. Co.

Designated the D-65, the machine digs 9½ feet deep, reaches 15 feet, and the hydraulic system is said to provide 6,200 pounds of digging force at the bucket teeth.

According to the manufacturer, the new model has been tested and approved by International Harvester for mounting on its Model 130 tractor. It may also be mounted on other light industrial tractors.

Utility bucket widths are available from 12 to 24 inches, and other buckets from 32 to 36 inches, inclusive.

Shawnee Mfg. Co., Dept. C&E, 1947 N. Topeka Ave., Topeka, Kans.

Circle No. 69.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

Crawler maintenance cost cut by hard-facing parts

At its refinery maintenance shop in Port Naches, Texas, the Pure Oil Co. has found that by hard-facing important parts on its dragline crawler assemblies, the service life of all components is greatly improved and maintenance costs are cut substantially.

Inspection of one unit after 15 months of service disclosed no parts requiring replacement, whereas prior to the hard-facing operation the company's maintenance engineers had found it necessary to replace track roller pin bushings—and frequently the track roller pins as well—every 12 months.

This preventive maintenance program involved the use of a number of alloys manufactured by the Wall Colmonoy Corp. Specifically, track roller pins are spray-welded with No. 6 alloy; track rollers are faced with No. 5 rod; sprocket teeth are hand-welded with No. 6 rod; bogie wheels are electric-arc welded with No. 1 electrodes; and track wheels are also electric-arc welded with No. 1.

All of the materials used are nickel-base and iron-base hard-facing alloys

Waterstop *in place in seconds!*

LABYRINTH WATERSTOP after first pour has been made and form removed. The grooves receive the concrete from the second pour, providing an interlocking joint.

Just a few seconds were needed to nail this LABYRINTH WATERSTOP to the form... just a few seconds and water seepage worries were over before they could ever have a chance to start.

LABYRINTH WATERSTOP forms a waterproof bond between two pours. The corrugated ribs bond firmly with the concrete.

LABYRINTH WATERSTOPS are made of flexible polyvinyl plastic... that has superior weathering qualities, is not affected by temperature changes and chemical activity.

LABYRINTH WATERSTOPS are easy to work with, can be cut to any desired length. "L" and "T" joints can be welded with just a hot knife. Find out now how your costs can be cut... and end your seepage problems. Just mail the coupon to:

WATER SEALS, inc.
9 SOUTH CLINTON STREET
CHICAGO 6, ILLINOIS

Made in Canada for
J. E. Goodman Sales Ltd.
Toronto, Ontario

WATER SEALS, INC. DEPT. 3
9 South Clinton Street
Chicago 6, Illinois

Send full information and sample

Name_____

Company_____

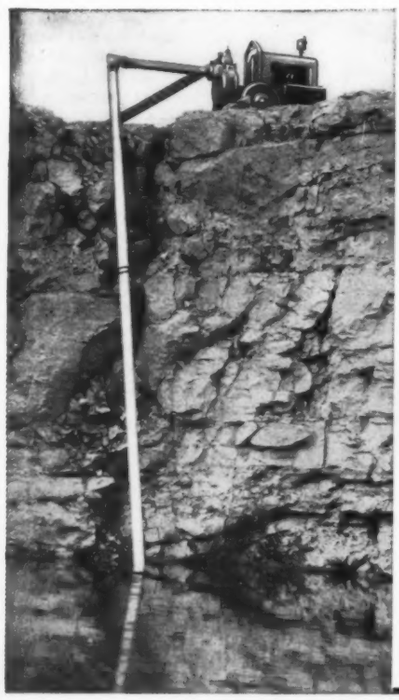
Address_____

City_____ Zone____ State____

For more facts, use coupon or circle No. 293

FOR 50 YEARS...
Finest in the Field!
Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready. Strike pay dirt now! Complete information and specifications await your letter.
DRAKE-WILLIAMS MOUNT
• OMAHA, NEBR.
OMAHA
DRAGLINE BUCKETS

For more facts, use Request Card at page 18 and circle No. 294



These pumps *guarantee* you lower-cost water handling on any job!

Whether it's a job requiring high suction lift—or a run-of-the-mill seepage problem—CMC Pumps have exclusive features that provide dependable workhorse performance you can count on.

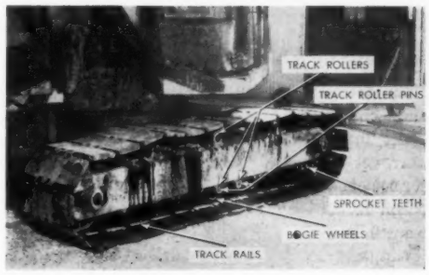
CMC Hi-Pressure centrifugals with auxiliary primer are well suited for water supply, jetting operations or any job where pressure is a factor.

DUAL PRIMERS – 1" to 10"
DIAPHRAGM PUMPS – 2", 3" & 4"
HI-PRESSURE PUMPS – 2" to 6"

New, FREE, Just-off-the-press CMC Pump Catalog
Write for yours today!

CONSTRUCTION MACHINERY COMPANY, Waterloo, Iowa

For more facts, use Request Card at page 18 and circle No. 295



◄ Points at which Colmonoy hard-facing alloys are applied to reduce maintenance costs on crawler assemblies.

containing chromium borides.

For further information on these hard-facing alloys write to Wall Colmonoy Corp., Dept. C&E, 19345 John R. Street, Detroit 3, Mich., or use the Request Card at page 18.

Circle No. 175.

Two diesel engines have improved design

Two new engines, compact and lightweight in design, have been announced by Caterpillar Tractor Co. They are the D318 and D315 Series G engines, modifications of the basic D318 and D315. Both G Series engines are offered either naturally aspirated or with turbocharger.

Designed for special applications where space and weight are important factors, the two new engines are said to be smaller and lighter than their standard counterparts. The standard D318 and D315 will remain in the Caterpillar line.

The D318 Series G engine has an over-all length of about 56 inches, 19 inches shorter than the standard model. Although weight has been decreased 370 pounds, the new engine develops 137 hp at 2,000 rpm. Turbocharging is said to increase this rating to 175 hp.

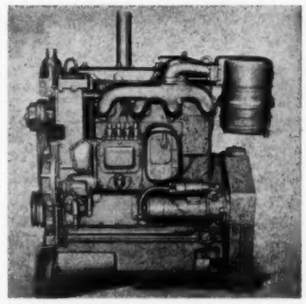
With a decrease in length of 16 inches over the standard model, the D315 Series G engine is 250 pounds lighter. Developing 91.5 hp naturally aspirated, the unit can achieve 115 horsepower through turbocharging.

Matching Caterpillar torque converters are available for Series G engines in either single or three-stage units.

Also announced by the firm is the new D353 diesel engine, said to be capable of delivering up to 390 hp at 1,300 rpm. Turbocharged for greater efficiency, this 6-cylinder engine has a 6¼-inch bore with an 8-inch stroke. The over-all length is 74 inches, width 47 9/16 inches, and height 76⅜ inches.

Caterpillar Tractor Co., Dept. C&E, Peoria, Ill.

Circle No. 25.



The D315 Series G diesel engine is designed to fill special applications where a minimum of space is available and where low weight must be considered.

Need HOSE in a *HURRY?*

Suction • Water • Steam
Air • Multi-Purpose
Discharge • Pile Driver

Wherever your job is—*whenever* you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—*when* and *where* you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

ATLANTA 8, Ga. 477 Eighth St., N.E.
BALTIMORE 18, Md. 15 East 21st St.
BOSTON (Alls.34), Mass. 12 Franklin St.
CHICAGO 10, Ill. 10 West Hubbard St.
CINCINNATI 2, Ohio 49 Central Ave.
CLEVELAND 15, Ohio 2731 Prospect Ave.
DETROIT 27, Mich. 13801 Schoolcraft Ave.
INDIANAPOLIS 4, Ind. 309 North Capitol Ave.
LOS ANGELES 23, Calif. 3121 East 12th St.
MEMPHIS 3, Tenn. 268 Madison Ave.
NEW YORK 7, N. Y. 81 Murray St.
PHILADELPHIA 6, Pa. 311 North Randolph St.
SAN FRANCISCO 24, Calif. 1352 Egbert Ave.
ST. LOUIS 8, Mo. 4018 Olive St.
SYRACUSE 3, N. Y. 739 Montgomery St.

CONTINENTAL DISCHARGE HOSE
Excellent for open end pump work, this hose has durable rubber tube reinforced with four plies of quality fabric. Tough rubber cover withstands rough use and abrasion. Sizes: 1″, 1½″, 2″, 2½″, 3″, 4″. Ask for catalog showing complete line of CONTRACTORS HOSE, HOSE FITTINGS, BOOTS and WATERPROOF CLOTHING.

HOSE by CR **CONTINENTAL**

CONTINENTAL RUBBER WORKS • 1989 LIBERTY ST. • ERIE 6 • PENNSYLVANIA

For more facts, use Request Card at page 18 and circle No. 296

GAR-BRO *Selection Chart*

Equipment	*Load Capacity*	*Maximum Travel Distance*	*Speed*	*Capacity* Per Hour*
POWER-CARTS	9 to 12 cu. ft.	1000 ft.	15 mpr.	15 to 20 cu. yds.
CONCRETE-CARTS	6 to 8 cu. ft.	200 ft.	walking	3 to 5 cu. yds.
WHEELBARROWS	3 to 5 cu. ft.	200 ft.	walking	1 to 1⅛ cu. yds.

**according to hauling distance*

POWER-CARTS

CONCRETE-CARTS

WHEELBARROWS

"Designed with Concrete in Mind"

SELECTION OF EQUIPMENT is most important in planning any concrete job—it can make the difference between profit and loss. That's why Gar-Bro offers check lists to guide you in considering all job factors. Remember, Gar-Bro builds the only complete line of concrete handling equipment. And only Gar-Bro dealers can give you unbiased advice in the selection of the best equipment. Write for catalog!

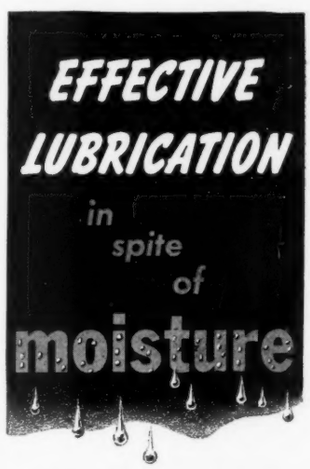
Ask your dealer for a Gar-Bro Concrete Handling Manual

GAR-BRO

GAR-BRO MANUFACTURING CO. • Los Angeles, California • Peoria, Illinois
General Offices: 2415 East Washington Blvd., Los Angeles 21, California

The world's most complete line of
Concrete Handling Equipment

For more facts, use Request Card at page 18 and circle No. 299



LUBRIPLATE 130-AA

affords machine parts and bearings real protection against rust and corrosion. It is a grease type lubricant that possesses the utmost in water and acid resistance. It has exceedingly high film strength. Due to the marked adhesiveness and water resistance of LUBRIPLATE 130-AA, it does not wash off readily, hence is the ideal lubricant in the presence of moisture.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

For more facts, circle No. 300

Western Concrete's Noble-Mobile batch plant produces 60 to 70 cubic yards per hour on this guided missiles plant job in Denver.

Job-site batching shaves haul costs

Job-site batching with a batching plant on wheels helps Western Concrete, Inc., Denver ready-mix supplier, get the bulk of an anticipated 200,000 cubic yards of concrete at the Glenn L. Martin Co. guided missiles plant in Denver.

In this highly competitive job, with several potential suppliers vying for the daily requirements of the seven contractors on a no-contract basis, Western Concrete employs job-site batching to cut hauling costs way below competitors' and consistently gets the bulk of the business. On a single occasion, Western hauled as much concrete with four transit trucks as a competitor hauled with 14 trucks. The competitor had a 10-mile haul.

Monolithic pours of up to 600 yards per day are required for the big, heavy concrete bases to hold rockets in their test cells. Western's job-site stationary plant did not have sufficient capacity for the peak demands. Another plant had to be brought to the job site to augment the output. Noble-Mobile was selected as it could be set up at a fraction of the cost of another stationary plant and on completion of the job could be economically moved to another site.

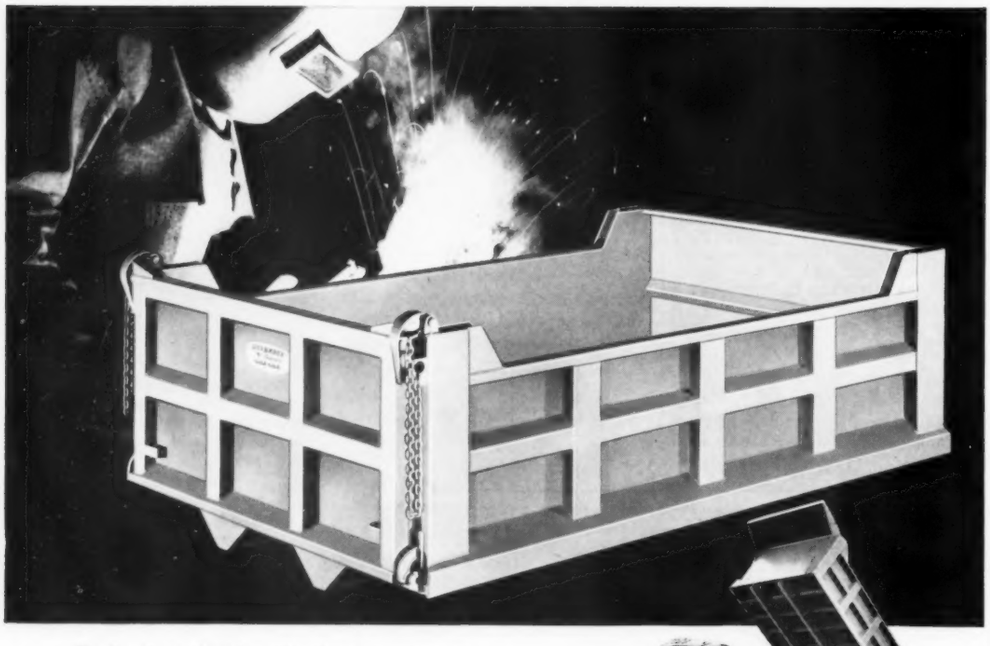
With the double plant operation, Western is able to move two lines of trucks on hauls from 300 yards to a maximum of 2½ miles. The resultant speed of delivery is another competitive advantage of Western Concrete. The Noble-Mobile produced 60 to 70 cubic yards per hour toward the bulk of the approximate 50,000 cubic yards of concrete poured in the first eight months.

For further information about these mobile concrete plants, write to the Noble Co., Dept. C&E, 1860 Seventh St., Oakland 20, Calif.

Circle No. 48.

LOOK TO DAYBROOK

...For the New Standard of Quality that Keeps Equipment on the Job!

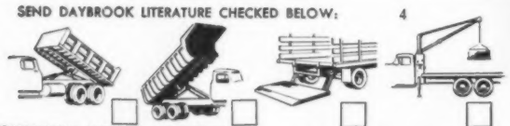


Daybrook equipped trucks give the contractor and excavator exclusive operating advantages that mean more profitable operation!

- Daybrook Dump Bodies feature heavy-duty understructures—improved hardware—a new standard of workmanship—that take rugged use . . . give longer life.
- Daybrook Hoists are 100% Daybrook design —feature roller bearing type pump—balanced spool, reciprocating type, three-position valve —a sealed hydraulic cylinder that merits a *one-year warranty*.

- Daybrook Hoists and Bodies are built to work together as a unit—truly, doubly dependable.
- Daybrook Dump Bodies and Hoists are available in models for any type load or capacity.

SEND DAYBROOK LITERATURE CHECKED BELOW: 4



CONSTRUCTION BODIES—HOISTS ☐ ROCK BODIES—HOISTS ☐ POWER GATE ☐ POWER LOADER ☐

Sign below, attach coupon to letterhead and mail in envelope.

Name

DAYBROOK Speedlift® TRUCK EQUIPMENT

DAYBROOK HYDRAULIC DIVISION
L. A. YOUNG SPRING & WIRE CORPORATION
BOWLING GREEN, OHIO

LAYCO

For more facts, use coupon, or Request Card at page 18 and circle No. 301

Versatile stake puller has adjustable plate

A device designed to pull stakes quickly and easily with no damage to the stake is offered by the Universal Form Clamp Co.

Adaptable to both wood and steel stakes, the stake puller features an adjustable plate on the jaw that will accommodate every type of steel stake—angle, tee, channel, flat, or round, according to the manufacturer. It will pull steel pipe or rods ¼ inch to 2½ inches in diameter, and can also be used to pull rods from concrete walls.

Universal Form Clamp Co., Dept. C&E, 1238 N. Kostner Ave., Chicago 51, Ill.

Circle No. 45.

Axles designed and built to exact specifications

Extra-heavy-duty axle shafts designed and built to individual requirements are offered by The U. S. Axle Co., Inc.

The axles are accurately machined to precision tolerances, and can be supplied for any type of road construction equipment made or used, it is reported.

Made of high quality alloy steels, the axles are heat-treated, then shot-peened—a special hardening process said to effect a remarkable increase in durability.

The U. S. Axle Co., Inc., Dept. C&E, Pottstown, Pa.

Circle No. 182.

The improved design of the Model RF23 Soil Mover has the cutting blade nearer the center of the bucket for full-capacity loading.

Improved scraper design permits larger loads

Important improvements in its Model RF23 2½-cubic-yard scraper are announced by The Soil Mover Co. According to the manufacturer, the new design makes the scraper easier to load, enables it to take on a larger load, and permits full-capacity operation while employing less power.

The cutting blade, formerly at the front edge of the bucket, is repositioned in the rear nearer the center of the bucket, enabling the bucket to fill to capacity more easily.

First, the rear fills, then the flow is toward the front. When both rear and front are filled, the flow is upward, filling the middle of the bucket. When the bucket is full and is raised into carrying position, the front apron closes so the bucket can retain all its load. The Model 23 is available with front and rear wheels, or with rear wheels only.

The Soil Mover Co., Dept. C&E, P. O. Box 53, Columbus, Nebr.

Circle No. 79.

New joist hanger eliminates mortising

Time-saving application is one of the many features claimed for the new Teco-Cal joist hanger. The device is formed from heavy-gage galvanized sheet metal, and comes complete with special 1½-inch nails for mounting.

In addition to a substantial cutting of installation time, the Teco-Cal hanger is said to eliminate shrinkage problems encountered with most conventional types, and to provide a stronger connection.

Only two sizes are required to handle all 2-inch dressed lumber from 2×6 to 2×14 inches. Flush joints, top or bottom, are easily achieved without mortising.

Timber Engineering Co. of California, Dept. C&E, 1485 Bayshore Blvd., San Francisco, Calif.

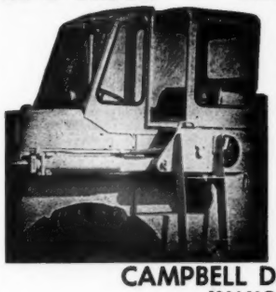
Circle No. 21.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

IT's NEW --- The Campbell Sliding Cab

for the models HU, HH, and HO

"Payloaders"!!!



This sturdy, modern design offers features long desired by "PAYLOADER" operators, among them—Sliding top, ball bearing mounted on steel channel—Rubber seals to insure weather tightness—Permanently mounted access ladder —Rear view mirror—Tinted safety glass windshield and skylight.

Investigate this completely new design in "Payloader" Cabs by calling your "Payloader" distributor, or contact

CAMPBELL DETACHABLE CAB CO.
WAUCONDA, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 302

Three LIMA Type 1250-SC Cranes owned by a major steel company are shown setting a girder for an overhead crane at a new open hearth furnace. Crane booms are 90 ft. long. The total lift, including equalizer beam, is 150 tons.

BRUTE STRENGTH FOR THE BIG JOBS

LIMA Type 1250-SC, 100-ton capacity on a 60′ boom at 13′ radius

You get all the muscle you need for almost any lifting job with the LIMA Type 1250-SC. There's reach aplenty, too, for it will swing a 200-ft. boom and 50-ft. jib with ease, hoisting steel and concrete to the top of a 24-story building.

The major functions of the Type 1250-SC are controlled through air-actuated clutches that are so smooth in operation that loads can be lifted and placed with pin-point precision. And, although the 1250-SC is in the heavyweight class, it can be knocked down for haulage into units of less than 60,000 lbs. Side frames and counterweight segments are easily removed and the gantry can be folded to a height of 12 ft., 7¼ in. for convenient job-to-job transportation. It is equipped with crawlers 16 ft., 10 in. wide and 20 ft., 7½ in. long for maximum stability. Diesel or electric power—with torque converter optional—is available.

Find out more about this stalwart machine from your nearby LIMA distributor. Or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Gantry is power-raised and power-lowered by means of boom hoist cable with the result that the crane boom can be quickly lowered to permit traveling under low clearances.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA SHOVELS • CRANES DRAGLINES • PULLSHOVELS

BALDWIN LIMA HAMILTON BLH

BALDWIN-LIMA-HAMILTON
Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

For more facts, use Request Card at page 18 and circle No. 303

CUTTING WIRE ROPE IS EASY the MORSE-STARRETT way

FAST — Especially designed cutting blade and dies assures fast cutting action. The hammer principle eliminates any special skill requirements.

CLEAN — Wire rope ends are cut smooth and clean for perfect threading or splicing.

SAFE — The enclosed cutting blade locked in the body of the cutter assures perfect safety.

PORTABLE — Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1-1/16 inch, 1-1/2 inch.

SEE YOUR DEALER OR WRITE DEPT. "B"

MORSE-STARRETT PRODUCTS COMPANY

1204 - 49th AVENUE, OAKLAND 1, CALIF.

For more facts, use Request Card at page 18 and circle No. 304

Product Parade

Atlantic field office trailers offer pleasant working conditions coupled with a high degree of mobility.

Poll indicates trailers favored over buildings

A recent poll of 18 contractors in the Atlantic Seaboard area indicated their preference for field office trailers over shacks and temporary buildings, according to a report from The Atlantic Trailer Corp.

Chief among the factors considered was the cost of erection and dismantling of the latter type structure. An average cost of $700 was reported, with the labor involved estimated at 4 man-days for erection and 2 man-days for dismantling. The field office trailer, it was pointed out, after the initial cost of approximately $1,700, requires practically no subsequent labor for relocation. The immediate mobility of the trailer was compared to the 1 to 3 days necessary to dismantle and transport a temporary building.

The report also mentioned the value of the trailer for advertising, as well as for the increased comfort of personnel. That improved working conditions, such as light, heat, and office facilities, produced increased personnel effectiveness, was the reported opinion of the contractors canvassed.

Other features of the field office trailer compared and found to be of superior merit include ventilation, wiring, safety, privacy, and waterproofing.

For further information on these mobile offices write to The Atlantic Trailer Corp., Dept. C&E, 719 N. Point Road, Baltimore 6, Md.

Circle No. 177.

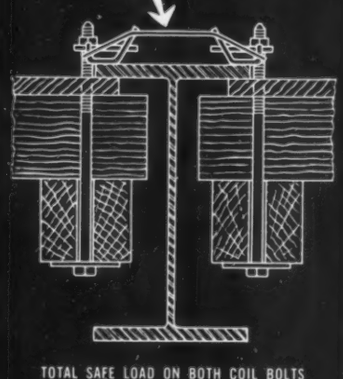
Offer self-contained vibratory compactor

A self-contained vibratory compactor for use on granular soil, stone subbase, asphaltic concrete, and soil cement mixtures is announced by Maginniss Power Tool Co.

Called the Powr-Pactor, the new compactor provides variable frequencies of from 2,400 to 7,000 vibrations per minute, with compacting forces ranging up to 4,000 pounds. This variable frequency and force permits selection of the exact degree of compaction necessary to produce uniform Proctor densities on any job, the manufacturer states. The compacting plate, of $\frac{3}{8}$-inch alloy steel, provides 12×18 inches of effective compacting area. The unit weighs 230 pounds.

Power is provided by a Wisconsin ACN air-cooled engine with standard

Faster Adjustment from TOP of Deck



TOTAL SAFE LOAD ON BOTH COIL BOLTS IS 10,000 LBS., OR 5,000 LBS. PER BOLT

..WHEN HANGING FORMS WITH

SUPERIOR PLATE HANGER FRAMES

With Superior Plate Hanger Frames the installation and necessary adjustment to bring the deck forms tight against the flange are from *above* the deck. Coil Bolts are passed through and secured from above with coil nuts. Bolts are easily removed without binding because, (1) nuts are square and will not turn; (2) embedment of the bolts in the concrete is at a minimum since the plate is only ½" above the flange.

FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

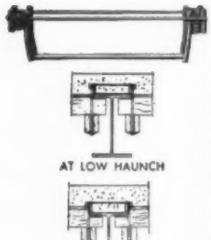
STANDARD COIL HANGER FRAME

When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

COIL BEAM SADDLE

On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

SPECIAL HANGER FRAME

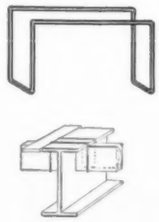


AT LOW HAUNCH

AT HIGH HAUNCH

The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch of varying depth on the upper flange. Superior *Special* Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail). Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt.

WIRE BEAM SADDLE



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

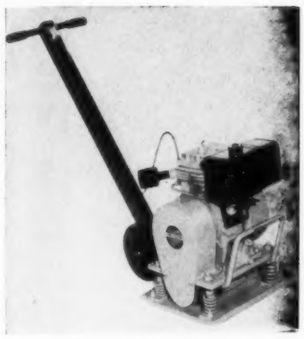
SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (A Suburb of Chicago)

New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

For more facts, use Request Card at page 18 and circle No. 305



Maginniss' new Powr-Pactor self-contained vibratory compactor features vibration-free engine and operator's handle.

carburetor. The engine is mounted on a vibration-free plate. Resilient damping springs are said to isolate vibration from engine and operator's handle. This assures maximum engine life without need for special components, and minimizes operator fatigue, the firm claims.

According to the company, the Powr-Pactor is designed for operating ease and efficiency. The engine throttle is located on the operator's handle, and a centrifugal clutch allows the engine to idle without vibrating the compactor. The clutch also permits engine starting and warm-up with the vibrator automatically disengaged. Dolly wheels facilitate movement on the job, and a lifting bail is provided for loading.

Powr-Pactors are also available with Hi-lectric 180-cycle or standard 60-cycle electric motor drive, in place of the gasoline engine.

Maginniss Power Tool Co., Dept. C&E, 154 Distl Ave., Mansfield, Ohio.

Circle No. 167.

This curing compound saved $60,000

Savings estimated at more than $60,000 were realized by the West Virginia Turnpike Commission when it used Permite concrete curing compounds rather than some older compounds on the turnpike.

According to W. D. McCleisch, superintendent for J. B. Michael & Co., Inc., of Memphis, Tenn., one of the paving contractors, the use of Permite resulted in a savings of 37 per cent in time and labor over the originally prescribed method of curing. Batch by batch, McCleish reported, Permite met the Commission's specifications.

Proper curing, good coverage, and savings in both time and labor, as well as low initial cost, were qualities of Permite that recommended it to the job and resulted in efficiency and economy in this curing operation.

For further information about Permite concrete curing compounds, write to Aluminum Industries, Inc., Dept. C&E, 3670 Werk Road, Cincinnati 11, Ohio.

Circle No. 49.

For more facts on these products, circle the indicated number on the Request Card at page 18.

For more facts, circle No. 306→

This new batching body, capable of hauling four full dry batches of concrete within legal load limits, is available from The Anthony Co. The body features a Teleramic headlift hoist, batch boards, and cement boxes. Both the tailgate and batch boards are air-operated from the cab. **The Anthony Co.,** Dept. C&E, 1750 Baker, St., Streator, Ill. **Circle No. 19.**

70,000 words about 35-ton LORAIN Moto-Cranes

(READING TIME 2 MINUTES)

VIRGINIA
Handling precast beams

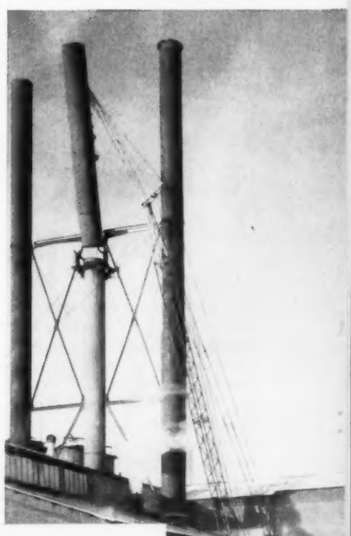
NEW YORK
Pile driving

TEXAS
Building refinery

COLORADO
Erecting transmission towers

MINNESOTA
Stack erection

CALIFORNIA
Erecting rocket test stand



OHIO
Steel erection

If a picture is worth 10,000 words, then here are volumes of testimony that Lorain 35-ton Moto-Cranes are on the job from coast to coast. These are only a few of the scores of Lorain MC-530W's working profitably for Lorain owners. The reasons are many. "Shear-Ball" mounting—Square-tubular-chord boom—2-lever, "Joy-Stick" air controls—and 8x4, 6x6, or 6x4 carriers are some of them.

Here is a 35-ton rubber-tire crane that is not just on the drawing board, but has had over a year of field operation to prove its worth. It will pay you to check it.

Your Thew-Lorain Distributor can give you all of the facts—and show you an "MC-530W" at work. There's one near you, on-the-job, making money for its owner.

THE THEW SHOVEL C
Lorain, Ohio

THE THEW LORAIN

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.

WINSLOW—PORTABLE TRUCK SCALE

"THE CONTRACTORS' SPECIAL SCALE"

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Cap.: 15-18-20-30, 50 tons. Write us for name of your nearest distributor

WINSLOW SCALE COMPANY P. O. Box 1198 Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 307

Modifications in the Euclid Model S-18 scraper consist of improved engine, better transmission gearing, and more efficient and accessible power control unit.

Modifications improve scraper performance

The improved Euclid Model S-18 scraper with 18-yard struck capacity is available from the Euclid Division of General Motors Corp. The modifications, which are said to increase performance, ease of operation, and ease of maintenance, consist of improved engine, better transmission gearing, and more efficient and accessible power control unit.

The lower, shorter 6-110 engine with Roots blower is rated at 300 hp and gives better performance, greater fuel economy, and more durability, the manufacturer states. The new blower improves fuel combustion and circulation of the air in the lower speed ranges. The new 4-speed Torqmatic Drive provides greater torque in the lower ranges where more power is needed for heavy loading work. It is said to permit the engine to operate continuously at its most effective output in any gear range, and to assure full flow of power to driving wheels without interruption when shifting.

Simplified operation and improved accessibility of the hydraulic control system for all scraper operations further reduce maintenance time for this machine. Through other improvements in design, the S-18 is said to have an even more effective power-to-weight ratio while retaining the structural stability and ruggedness necessary for scrapers working with the biggest of pusher tractors.

The improved Model S-18 is equipped with Euclid planetary drive axle and No-Spin differential, 4-section cutting blade, hydraulic lever action for bowl, apron and ejector, and 27.00×33 tires. Top travel speed with full load is 20 mph.

Euclid Division, General Motors Corp., Dept. C&E, 1361 Chardon Road, Cleveland 17, Ohio.

Circle No. 4.

SERVAIR DEMAND CONTROL

ONLY JOY AIRVANE PORTABLE COMPRESSORS HAVE THIS NEW FOOL-PROOF LOAD CONTROL

The new Servair Demand Control takes the mystery out of pressure setting . . . makes it as simple as turning up the furnace thermostat at home. You just set the dial for the pressure you need and the Joy Airvane Rotary will deliver it.

The Servair is a true "demand" load control because it matches compressor output to demand . . . from 0% to 100% capacity. The control maintains steady air pressure regardless of the number and size of tools cutting in and out during operation, yet runs the engine only fast enough to meet the demand for air. This gives you top fuel economy and a minimum of wear and tear on the engine and compressor.

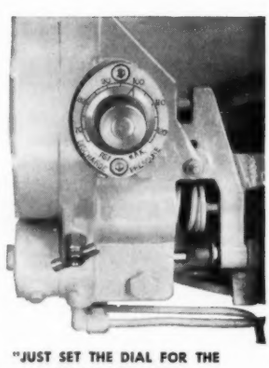
Joy Airvane Rotaries have many other features that make them trouble-free:

THERMAL BY-PASS—an exclusive oil circulating system that provides immediate lubrication and temperature control under all weather conditions.

DIRECT DRIVE—efficient spline coupling eliminates clutch (and clutch maintenance).

READY ACCESSIBILITY—to controls and items normally requiring regular maintenance.

You should get the whole story on Joy Airvane Portables before you consider *any* new compressor. Write ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** *In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*



"JUST SET THE DIAL FOR THE PRESSURE YOU NEED"

JOY . . . EQUIPMENT FOR CONSTRUCTION . . . FOR ALL INDUSTRY

WRITE FOR FREE BULLETIN 181-21

Portable Air Compressors

Wagon Drills

Rock Bits

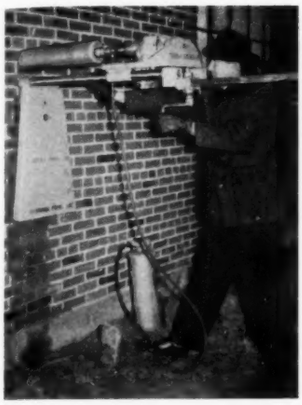
Hand-Held Rock Drills

For more facts, use Request Card at page 18 and circle No. 308

New core drilling unit uses diamond bits

A versatile new core drilling unit is announced by Diamond Products, Inc. Called the Hustler, this new core drilling unit is used to cut holes in existing floors or walls for conduit and piping or to extract test cores of highways and buildings for laboratory analysis.

Using surface-set diamond or diamond impregnated coring bits, the Hustler unit is said to drill through cement block at a rate of one minute



New Diamond Products core drilling machine.

per foot, and reinforced concrete aggregate at 5 to 8 minutes per foot. Holes and cores are clean and neat, and cracking, chipping, or splitting is practically eliminated, the manufacturer claims. The unit may also be used for drilling through glass, ceramic or glazed tile, marble, etc.

The basic unit (less motor) weighs only 80 pounds and is described as adaptable to any air or electrical motor. The Hustler unit may be used in either horizontal or vertical drilling and provision is made for attaching the unit to walls to make it self-supporting in horizontal drilling.

The diamond coring bits are available in diameters from ¼ inch through 6½ inches in various grades of surface-set diamonds or diamond impregnated matrices. The water swivel cooling system and coring bits are combined and no special adapters are necessary.

Diamond Products, Inc., Dept. C&E, 420 Prospect St., Elyria, Ohio.

Circle No. 7.

New heavy-duty tripod for levels and transits

A new Universal tripod for engineers' and builders' levels and transits has been introduced by the David White Instrument Co.

The No. 9010 tripod is said to offer solid support for heavy-duty instruments, with a wide frame of European-type construction. Because of its design, the tripod has great stability and is not affected by vibration or wind, the manufacturer claims. The head is American Standard 3½-inch diameter with 8 anodized threads to the inch. Each leg uses triangular truss, bridge-like construction, with solid metal support braces that put pressure against the wood legs for solid support.

Each spoke of the legs is painted partly red and partly white for safety in the field and to aid in locating the instrument. All metal parts are die-cast from lightweight high-tensile aluminum, finished with gray, wrinkled enamel. Weight is 9½ pounds.

David White Instrument Co., Dept. C&E, 2501 N. 19th St., Milwaukee 5, Wis.

Circle No. 169.

SAVE MONEY
SEND US YOUR ORDERS FOR ROTARY SWEEPERS NEW BROOM CORES

Do You Know We Manufacture NEW Cores of the Following Types:

- Grace (3 types)
- Hough
- M-B (Melfi-Blumberg)
- Detroit-Harvester
- Fordson
- Roco
- Little Giant
- Huber
- Lull
- Spearswell

and other popular makes

YES! We Can Make Cores to Your Specifications

We Rebuild—Repair—Refill All Makes and Sizes of Broom Cores.

Immediate Shipment

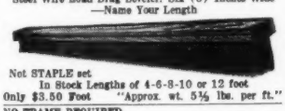
SUGGESTION—To Far-Away Users—Buy your NEW Cores only without any filling or we will furnish complete Palmyra-Hickory or Bass Fibres—Even Steel Wires.

Road Builders—It's Sensational! !

BIG PECKERWOOD BIG

C-O-N-T-I-N-U-O-U-S

Steel Wire Road Drag Leveler. Six (6) Inches Wide —Name Your Length



Not STAPLE set.

In Stock Lengths of 4-6-8-10 or 12 foot

Only $3.50 Foot "Approx. wt. 5½ lbs. per ft."

NO FRAME REQUIRED

The LITTLE PECKERWOOD

3" Wide, 15" Length This Fits Your Frame NOTE—Both Drags Can Be Furnished with Fibre. Only $2.50 Ea.

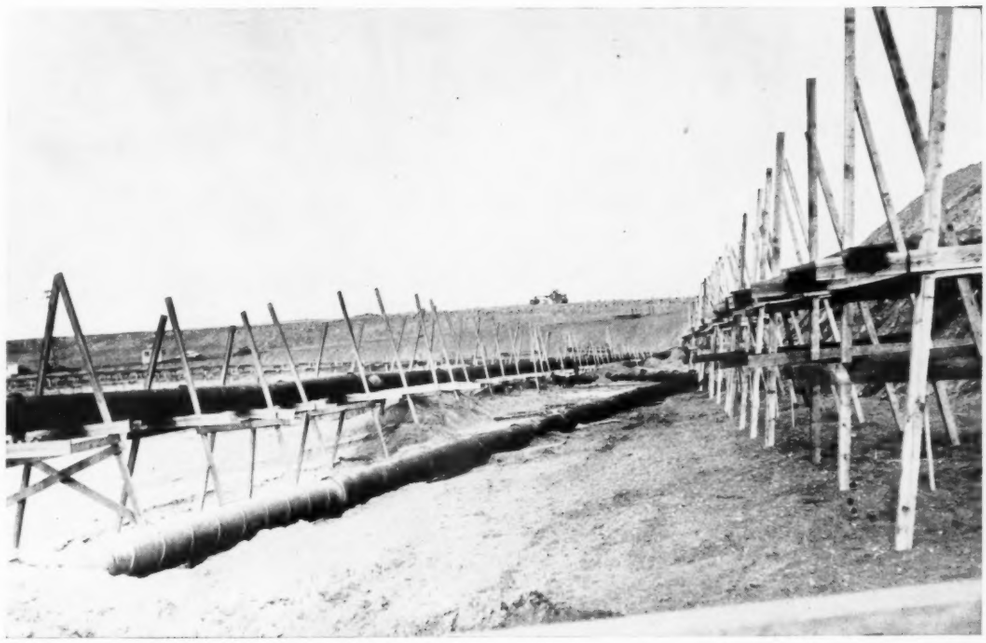
KENNEDY'S

Since VAN BRUSH MFG. CO., INC. 1928

327 Southwest Blvd., Kansas City, Mo.

For more facts, circle No. 309

HAULS AND DELIVERS FILL



. . . Wherever You Want It!

When the job calls for hydraulic placement, you can depend on Naylor Spiralweld for the piping layout that will do the job—faster and at lower cost.

Naylor's exclusive spiral-lock structure creates the one lightweight pipe with the strength and safety required for the rough treatment involved in this service.

Its light weight simplifies handling. Installation is faster, too, with the one-piece Naylor Wedgelock coupling to speed connections. Lines can be knocked down, moved, and re-assembled in minimum time when you use this Naylor pipe and coupling combination.

For full details, write for Bulletins No. 507 on pipe and No. 513 on Wedgelock couplings.

NAYLOR

NAYLOR PIPE COMPANY
1270 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office:
60 East 42nd Street, New York 17, New York

For more facts, use Request Card at page 18 and circle No. 310

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

SWENSON SPREADERS Speed Sealcoating!

Spreads Salt or Chloride for DUST CONTROL or SOIL STABILIZATION

write for complete information

SWENSON SPREADER & MFG. CO.
Lindenwood, Illinois

For more facts, use Request Card at page 18 and circle No. 311

The new Model 90 Jersey spreader.

Spreader is designed for smaller paving jobs

The new Model 90 Jersey spreader is announced by the Tractor Spreader Co. The Model 90 was specifically designed to handle the smaller paving jobs. Tractors equal in size and power to the Cat D4 or D6; Allis-Chalmers HD-6 or HD-9, and International TD9 or TD14 may be used as a propelling unit. The hooking-up operation may be accomplished in approximately 30 minutes.

Although only 10 feet wide, the Model 90 will spread in widths from 9 to 12 feet. It has a maximum spreading depth of 12 inches, a minimum of 1 inch, and will lay up to 12 tons per minute, the manufacturer reports.

Suggested applications for the machine include parking areas, development roads, city streets, and shoulder work.

Tractor Spreader Co., Dept. C&E, 630 Terrace Ave., Hasbrouck Heights, N. J.

Circle No. 38.

Concrete bucket features hydraulic operation

A hydraulic concrete bucket in which the power for operation is entirely self-contained is available from Blaw-Knox Co. This self-contained power is said to accelerate the placing of concrete, and make the bucket safer to operate.

The use of an air hose, with the consequent need for compressed air at the job site during concrete placing, is eliminated. Instead, the weight of the bucket generates the needed pressure for operating the clam discharge gates. The bucket hangs from its pendant on two hydraulic cylinders or accumulators. Operating a lever on the hydraulic valve permits the bucket's weight to transmit pressure to the gate cylinders which operate the gates.

Sufficient oil is stored in the hydraulic system for emptying a portion of the bucket's load, closing the gates, and then reopening them for a second pouring. When the bucket is set down, the spring-loaded pendant drops, reversing oil flow in the hydraulic system. This automatically recharges the

This, and the fact that Royal Blue is stronger than the strongest you have been using, has helped to make it the most widely favored rope in Roebling's history. It will work hard and last longer on *your* job. Your distributor or Roebling Sales Office will give you full information, or write: John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country
Subsidiary of The Colorado Fuel and Iron Corporation

For more facts, use Request Card at page 18 and circle No. 312.

Blaw-Knox Co.'s CHC4 hydraulic concrete bucket is equipped with self-contained power for operating the discharge gates.

bucket for power operation. The open and close speed of the new hydraulic bucket's clam discharge gates is said to be more than twice as fast as that of available air-operated types. The four-way operating valve is spring-loaded to keep the gates closed and will also allow partial gate opening for dribbling operations.

The circular-type bucket is equipped with a rectangular gate measuring 30×48 inches, said to eliminate arching of concrete over the discharge throat. Over-all height is 165⅞ inches, with an outside diameter of 74⅝ inches. The bucket is heavily reinforced to withstand rough usage, the company states.

Blaw-Knox Co., Dept. C&E, 300 Sixth Ave., Pittsburgh, Pa.

Circle No. 5.

New ¾-yard trench hoe dipper for 30-inch cuts

A ¾-cubic-yard cast weld trench hoe dipper designed for 30-inch-wide trenching operations is announced by the Renner Mfg. Co.

According to the manufacturer, the dipper has a new lip design and a one-piece heat-treated alloy bot-

tom casting assuring long life and good wearability in the toughest digging. The sloping-back construction is said to eliminate heeling and to insure maximum dumping speed.

The Renner dipper will fit any make machine, the manufacturer states.

Renner Mfg. Co., Dept. C&E, P. O. Box 125, Butler, Wis.

Circle No. 82.

For more facts on these products, circle the indicated number on the Request Card at page 18.

New lightweight engine produces up to 45 hp

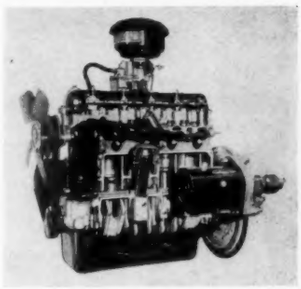
A compact, lightweight industrial engine is announced by the Fageol Products Division of the Twin Coach Co.

Designated the Fageol 44, the engine produces up to 45 horsepower at 5,500 rpm, with running engine weight as low as 160 pounds. Weight-to-power ratio of 3.55 pounds per horsepower is attained, the manufacturer says. The 44-cubic-inch-displacement engine measures only 23⅝ inches long including SAE No. 5 bell-housing, 15 9/16 inches wide, and 23⅞ inches high.

According to the manufacturer, exceptional fuel economy and high power output in relation to size and weight make the Fageol 44 ideal for use in applications where compact size and light weight are important.

Fageol Products Div., Twin Coach Co., Dept. C&E, 850 W. Main St., Kent, Ohio.

Circle No. 64.



The Fageol 44 industrial engine is less than 24 inches long, produces up to 45 hp.

One of Watkins' 26 Macks receiving a load of crushed gravel from a crusher fed by a 1¾-yard shovel.

on the Spaulding Turnpike . . . big-yardage fills at low hauling costs

Grading a three-mile section of New Hampshire's Spaulding Turnpike, R. G. Watkins & Sons, Inc. of Amesbury, Massachusetts, put down 1,580,000 cubic yards of common borrow and 100,000 cubic yards of gravel. This pike, with two 24-foot lanes separated by a 12-foot median, is a 22-mile addition to the Seacoast Turnpike near the White Mountain area. High fills along the Cocheco River and at intersecting roads required big yardage borrow.

Fourteen of the 17 dumpers used by Watkins & Sons on this high-volume hauling were Macks. Here's the kind of job where Mack efficiency and dependability really pay off in minimum hauling costs. The ability to maintain tight schedules, to keep going month after month with only routine servicing and maintenance, and to operate with ease over difficult terrain and in all kinds of weather puts Macks in a class by themselves for real profit-making performance. Reason enough why Watkins & Sons has 26 Macks in its fleet of 32 dumpers.

Why not let your Mack representative bring you up to date on the most complete line of heavy-duty trucks in the industry? Dumpers, mixers, tractors, flat-bed trucks—there's a Mack that will do your toughest jobs more economically, more efficiently, and more profitably. Mack Trucks, Inc., Plainfield, N. J. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

5023

For more facts, use Request Card at page 18 and circle No. 313

Three Getman Scoot-Crete T-52 14-cubic foot units were used to advantage in the construction of a 3-story meat-processing plant in Kearny, N. J. The contractor, Carl Buhr, Inc., of New York City, built a special ramp for the machines and used them for hauling block and brick, as well as the concrete mixture. One man can load, drive, and dump the Getman machine, carrying loads up to 3,500 pounds at speeds up to 15 mph, the manufacturer states. It operates both forward and in reverse, with four speeds available in both gears, and reportedly can climb up to 25 per cent. For further information on the Scoot-Crete, write to **Getman Bros.**, Mfg. Div., Dept. C&E, Highway 31 at Phoenix Road, South Haven, Mich. **Circle No. 109.**

only a
Snap-TY
gives you
all this

1 Full-size Rod (.225 diameter) for maximum strength.

2 Offset Type Flats for better anchorage to prevent turning.

3 Upset behind spreader washer for **positive** wall size (loose or restrained washers optional).

4 Durable, malleable iron TY-Holder that is bottom-heavy and ribbed for stability. Needs no nailing!!

5 Well-formed Heads. No interference from die marks. A quality tested, precision-built TY.

6 Uniform, flat-surfaced Head Washer that insures proper bearing.

If it is not
Richmond
it is not a
Snap-TY

Over thirty types of Snap-TYS are available—a type for every need. And all are proved, tested products with Richmond's 46 years of experience behind them.

These are the reasons why it will pay you to insist on Richmond Snap-TYS. INSIST on Richmond and BE SURE it's Richmond! Send for current Richmond Handbook which describes the full line. Write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, New York, or 315 South Fourth Street, St. Joseph, Mo.

INSIST ON RICHMOND
... AND BE SURE IT'S RICHMOND!
Richmond
SCREW ANCHOR CO., INC.

For more facts, circle No. 314

Offer digger, crane for use on pickup truck

The Watson - Robin digger works from a power take-off flexible shaft attached to the rear end of pickup truck.

Two pieces of equipment that when mounted on an ordinary pickup truck transform the vehicle into a hole-digging and pipe-laying unit are announced by the H. S. Watson Co.

The Watson-Robin digger works from a power take-off flexible shaft attached to the rear end under the truck body. Holes up to 40 inches deep and 10½ inches in diameter can be dug, according to the manufacturer. With fencing, posts, and other building materials carried in the truck, the driver can build as he goes.

The Watson crane is mounted in a detachable socket well in the body floor at the rear of the pickup. The crane is said to have 500, 1,000, or 2,000-pound capacities, with a 360-degree swing and up to 32 inches in reach. Beside its use in laying pipe in trenches, some sizes of underground tanks can be handled, as well as oil drums, engines and other heavy items.

H. S. Watson Co., Dept. C&E, 1316 67th St., Emeryville 8, Calif.

Circle No. 47.

This Jaeger 2PN pumps 10,200 gph through a 2" suction line — all the water a 2" hose can handle. **With 2½" hose, it pumps 14,400 gph.**

Big New Capacities in Jaeger Pumps

Tests of latest model Jaeger "Sure Prime" centrifugals, reproducing actual job conditions, establish *new high capacities and performance never before guaranteed* to users. For example, a light Model 3XP now pumps 19,500 gph at 10′ static suction lift, the Jaeger 6P pump now has an actual performance exceeding 100,000 gph. Base your pump buying on latest information. Sizes 1½" to 10". *See your Jaeger distributor or write for catalog.*

THE JAEGER MACHINE CO., 701 Dublin Avenue, Columbus 16, Ohio
COMPRESSORS • MIXERS • PAVING SPREADERS, FINISHERS

For more facts, use Request Card at page 18 and circle No. 315

EFFICIENCY
AND
ECONOMY

LENKER
AUTOMATIC
LEVEL ROD

EVERY
ROD READING
AN
ELEVATION
NO
COMPUTATIONS

Awarded
MEDAL OF MERIT
FOR UTILITY
~ BY ~
FRANKLIN
INSTITUTE
OF
PHILADELPHIA

Write for Circular
LENKER MFG. CO.
599 CHESTNUT ST.
SUNBURY, PA.

For more facts, circle No. 316

The Trac-Paver features hydraulically controlled paving speeds from 5 to 60 fpm.

"The men are going crazy about the new waterboy".

Bituminous paver is maneuverable unit

A medium-class bituminous paving machine is announced by the Trac-Machinery Corp. Called the Trac-Paver, the unit is said to be highly maneuverable, permitting paving in tight places and eliminating hand raking. The machine lays a uniform mat, well compacted and ready for rolling, the manufacturer reports.

The features of the Trac-Paver include hydraulic steering, hydraulically operated screed mechanism, hydraulically controlled paving speeds from 5 to 60 fpm, LP gas heated screed, and a 7-foot turning radius.

The machine moves from job to job under its own power.

Trac-Machinery Corp., Dept. C&E, Nunda, N. Y.

Circle No. 26.

Joint filler compound for variety of uses

A new type of expansion joint material and calking compound said to elongate up to 325 per cent through the normal temperature range of 70 to 80 degrees F is announced by A. C. Horn Co., Inc., a subsidiary of Sun Chemical Corp.

Called Hornflex, the material maintains a tight seal of joints by squeezing and stretching with any movement, and is especially effective in curtain wall construction and on surfaces where adhesion is difficult, according to the manufacturer.

Among the applications of the compound are the filling and sealing of surface joints, as well as between metal panels and building materials of dissimilar texture.

The product, which is mixed prior to use and applied either by calking gun or knife, is said to set to touch in 12 hours under normal conditions and to attain maximum strength in seven days. In case of vibration and continual movement in the joint, maximum strength can be attained in less time by damp curing.

A. C. Horn Co., Inc., Dept. C&E, 10-10 44th Ave., Long Island City, N. Y.

Circle No. 77.

Ski lift operators stress safety when it comes to buying wire rope. Too many lives are at stake. So they buy . . .

A Safe Lift

Even though you don't operate a ski lift, false economy can be costly in your rope purchases, too. For a rope failure can cause personal injury . . . wreck your equipment . . . throw off your entire work schedule . . . and affect employee morale. Yes, a "bargain" wire rope may save you money, yet cost you your peace of mind. Don't take a chance. Buy a rope that's a quality rope—buy Wickwire Rope.

WICKWIRE ROPE A CF&I PRODUCT

CF&I

LOOK FOR THE YELLOW TRIANGLE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

5050

THE COLORADO FUEL AND IRON CORPORATION — Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION — Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans
New York • Philadelphia

For more facts, use Request Card at page 18 and circle No. 318

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

SMOOTHER HIGHWAYS IN FAR LESS TIME

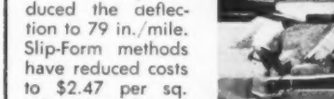
(NO PAVING FORMS REQUIRED)

Contractors have reached a production of 3700 lin. ft. per day, without costly stationary forms. The 32000 lb. Quad-City, Slip-Form Paver is a complete paving train in one machine. It strikes off, compacts by vibration, tamps, meters, extrudes, finishes, belts, and confines the edges to proper width and alignment, at the same time controlling the finished surface to better than specified tolerances and insuring proper thickness.

THE NEW QUAD-CITY **SLIP FORM** CONCRETE PAVER

NEW RECORDS

After 3 years continued use of the Slip-Form method, one County reduced the deflection to 79 in./mile. Slip-Form methods have reduced costs to $2.47 per sq. yd. with additional saving of 9¢/sq. yd. reported in 1957.



QUAD-CITY EQUIPMENT CO.
ROCK ISLAND, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 319

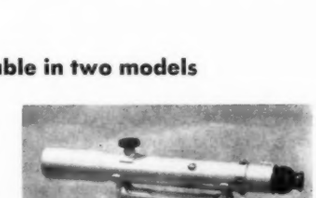
In 21 months, one Model HR Payloader hauled enough sand and gravel to mix all of the concrete that went into the new $8 million Dallas, Texas, Memorial Coliseum. The job of the Payloader was to haul some 60,000 tons of aggregate from stockpiles to the mixers, about 200 feet away, for all the concrete to be used in the structure. For more information about Payloaders, write to **The Frank G. Hough Co.**, Dept. C&E, Libertyville, Ill. **Circle No. 110.**

New light dumpy level available in two models

A new light dumpy level is introduced by W. & L. E. Gurley. The unit is designed chiefly for engineers constructing foundations, abutments, retaining walls, or piers; in grading streets or highways; in setting steel for buildings and roads; in hydraulic or drainage projects; or in setting machinery. Two models are available.

The Model 380 is without a horizontal circle. The other, the Model 380-A, has a circle for reading horizontal angles to 5 minutes.

The telescope is 13 inches long, with a minimum focus of 6½ feet. The spirit level features protective mounting, "standout" bubble, and sensitive uniform movement, according to the manufacturer.



The instrument comes in a hardwood carrying case, with protective packing blocks to preserve adjustment.

W. & L. E. Gurley, Dept. C&E, 518 Fulton St., Troy, N. Y.

Circle No. 105.

1,000 Man-hours Saved on Highway Job with GRIPHOIST

GRIPHOIST TIRFOR

When you bid — figure on GRIPHOIST

You too can save. On 12-span bridge job, 8-man gang, using conventional methods, dismantled one set of forms in 14½ hours. Then Super placed three needle beams under forms and installed 6 GRIPHOISTS with cables attached to beams. Six men lowered 45-ton forms in 2½ hours . . . saved 1,000 man-hours.

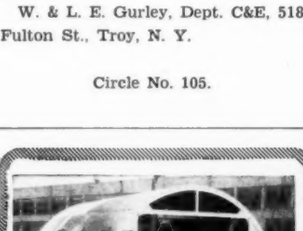
Write for brochure depicting scores of GRIPHOIST uses.

East of Mississippi
Princeton Griphoist 32 GEORGE ST. BOSTON 19, MASS.
West of Mississippi
Griphoist, Inc. 424 BRYANT ST. SAN FRANCISCO 7, CALIF.

EASY TO DROP 45-TON BRIDGE FORM

Upper—close-up of 3 manually-operated GRIPHOISTS used as lowering device. *Lower*—start of smooth, simple GRIPHOIST operation that cuts stripping time.

For more facts, use Request Card at page 18 and circle No. 320



MAYO STEEL FORMS SPEED TUNNEL JOBS IN THE PHILIPPINES*

*5.2 Diameter Tunnel—Invert Last Ambukled Project

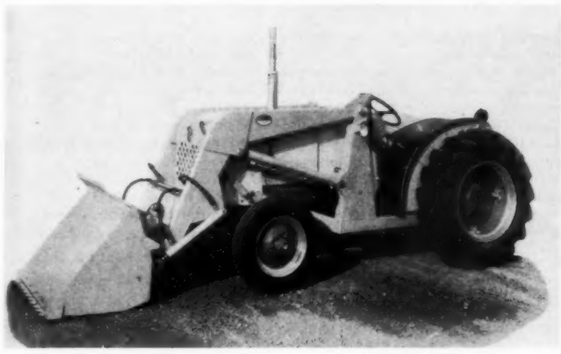
Mayo produces all types of Tunnel Forms—telescopic, non-telescopic, separate sidewall and arch, single unit, full round forms for monolithic pours, etc. Each is designed for the exact requirements of the job in any part of the world—be it tunnel, sewer or conduit.

Write for FREE Bulletin No. 22 or send details.

STEEL FORMS • HEADFRAMES • MUCK BINS • SHIELDS • AIR LOCKS • LOCOMOTIVES • MINE CARS • GROUTERS

MAYO
TUNNEL AND MINE EQUIPMENT
LANCASTER, PENNA.

For more facts, circle No. 321



The Henderson Chief loader, with new automatic hydraulic bucket-leveling device, is available with a full line of attachments.

Loader has new bucket leveling device

A fifth cylinder automatic hydraulic bucket-leveling device is one of the new features on the Chief hydraulic loaders available from the Henderson Mfg. Co., Inc. Mounted on the left frame support, the device replaces the old-style linkage principle, and allows the operator complete freedom for tractor operation.

The 12-gpm hydraulic system is said to lift 1,750 pounds to full height in 6 seconds and down in 3 seconds, with other features including chrome hi-carbon steel rods and double-acting cylinders throughout and finger-tip control of all hydraulics.

The steel box frame, electric welded to form a single shock-resisting unit, offers full view operation and step-on side mount design.

Models are now available to fit these utility tractors, among others: Case 300 and 310; Oliver 55 and Super 55; International 300 and 350; Minneapolis-Moline 335 and 445; Ford 640 and 860; Ferguson 40; and Massey-Harris 50.

A full line of attachments, including dozer blade, utility bucket, crane boom, fork lift, and scarifier are available.

Henderson Mfg. Co., Inc., Dept. C&E, 1203 Rockford Road S. W., Cedar Rapids, Iowa.

Circle No. 36.

Pneumatic industrial tire available up to 12 ply

A pneumatic industrial tire designed for use on units such as fork lifts and industrial tractors is offered by the Goodyear Tire & Rubber Co. Called the Super Rib, the tire is available in tubeless or tube-type design, and in sizes ranging from 3.40/3.00×5, 2-ply, to 7.50×10, 12-ply rating.

The tire features deep-cut slots in five saw-tooth riding ribs which, during compression with driving surfaces, are said to minimize spinning and skidding. A balanced design places equal load on each cord, while the tire's wide, flat tread augments its stability and assures safer vehicle loading, according to Goodyear.

Goodyear Tire & Rubber Co., Dept. C&E, 1144 E. Market, Akron, Ohio.

Circle No. 86.

WHEN THAT METAL CUTTING JOB IS REALLY

TOUGH!

Make it EASY! (and cut costs) with this . . . . RUGGED POWERFUL

HKP PORTER HEAVY DUTY CUTTER

IT CUTS THESE TOUGH METALS EASILY!

— HARD METALS — CONCRETE REINFORCING RODS — HARD WIRE ROPE — CHROME BALL WIRE — COLD DRAWN ALLOY STEEL — TEMPERED STEEL WIRE

Why fool around with other tools, when the job calls for a PORTER HEAVY DUTY METAL CUTTER? Let those heat-treated, drop-forged, abuse-resistant jaws make the work easy, and less costly. Handles on 590HD size are all steel. This rugged, multi-job tool is designed for cutting the hardest bolts, rods and hard cable. Nothing better for construction companies and heavy industries.

for CUTTING STEEL CABLE and WIRE ROPE use the STEEL CABLE CUTTER

The jaws in this shear-action, clean cutting STEEL CABLE CUTTER are notched to lock the cable in during cutting action to minimize crushing. For cutting soft or hard steel cable or wire rope up to ¾".

for CUTTING CHAIN use the HARD CHAIN CUTTER — 590HC

The right way to "cut" hard chain, alloy and case-hardened tempered spring wire and case-hardened bolts and screws is to crush (not cut) them with the center cut, round edge action of this PORTER HARD CHAIN CUTTER. Cuts one side of link at a time to prevent damage to tool. Capacities up to ½".

WRITE for catalog showing these and other PORTER METAL CUTTING TOOLS.

HKP

H. K. PORTER, Inc.
Somerville 43, Mass.

For more facts, circle No. 322

Fast & Easy when you move rigs by MILLER Tilt-Tops

Model "BT" - 10 tandem $1,630.00*

Model "B" 6 ton $1050.00*

*F.O.B. Milwaukee

Complete with platform and tires. Any optional equipment extra.

*Plus 10% Federal Tax

With a MILLER Tilt-Top . . . it takes just ONE man less than TWO minutes to tilt, load, be off to the next job with no lost motion. Whatever you haul . . . front end loaders, shovels, pavers, rollers or backhoes, there's a MILLER Model to handle it from 3 to 13 tons. Highly maneuverable, easy to back, MILLER Tilt-Tops cut between-job loading and hauling time . . . increase production time every day. Big oak decked platforms . . . provide, when tilted, one continuous surface with the ground for quick, safe, drive-on loading. MILLER Tilt-Tops are available with over-the-wheels platforms, between-the-wheels platforms in several lengths (8' x 14' standard on "B" models — optional 16' or 18' lengths on order.) For FAST, EASY hauling of all kinds of rigs . . . get a MILLER Tilt-Top . . . it'll more than pay for itself!

✓built best
✓priced best

See your MILLER distributor or write for FREE literature to:

Miller® Tilt-Top Trailer Inc.

MILWAUKEE 14, WIS.
456 S. 92nd St., Milwaukee 14, Wis.

For more facts, use Request Card at page 18 and circle No. 323

It's more than just an arc welder!

Operate tools, lights, motors, etc.

Use your own men. Do your own repair and construction work right on the job and keep valuable equipment working. Save hundreds of dollars on replacement parts and avoid costly delays. Always ready—welds anywhere. Provides emergency 110 AC power when and where you need it.

HOBART BROS. COMPANY, BOX 877, TROY, OHIO
Phone FEderal 2-1223

A wide selection of types and sizes air-cooled . . . or water-cooled

"Husky Boy" "Contractor's Special" "Gas Drive"

Hobart "One of the world's largest builders of arc welding equipment."

CHECK for free Weldor's Vest Pocket Guide

Write for information on Hobart Welding School

HOBART TROY OHIO WELDERS

Hobart Brothers Co., Box 877, Troy, Ohio
Please send me current information, without obligation, on the following checked items:
☐ "Husky Boy" ☐ "Contractor's Special"
☐ "Gas Drive"
☐ Check here if you wish free copy of Weldor's Vest Pocket Guide ☐ Welding School
Name_____ Position_____
Firm_____
Address_____

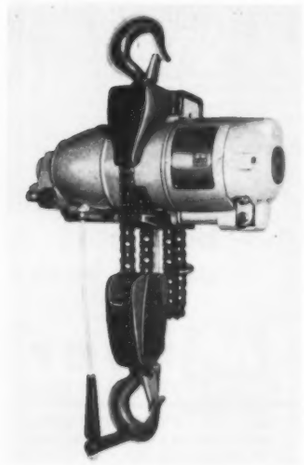
For more facts, use coupon, or Request Card at page 18 and circle No. 324

This improved Jackson compactor is of the vibratory pan type and has six independent detachable compactor units that may be operated individually or in groups to fit job requirements. Power has been increased to the point where each of the compacting units delivers up to 4,200 3-ton blows per minute—an increase of approximately 2,000 pounds per blow over the previous model, according to the manufacturer. Among other improvements is a single industrial engine operating both the generators and the transmission. Two generators produce single-phase and 3-phase 110-130 volt, 60-cycle ac, and it is pointed out that with the compactors removed, the machine constitutes an efficient mobile power plant. The machine's speed of travel is said to range from 10 fpm to 10 mph. For further information on the compactor, write to **Jackson Vibrators, Inc.**, Dept. C&E, 1947 Ludington Ave., Ludington, Mich. **Circle No. 112.**

New air-powered hoist has 4,000-pound capacity

A 4,000-pound-capacity air-powered hoist is announced by the Gardner-Denver Co.'s Keller Tool Division.

Fitted with either roller or link chain, this hoist features lifting and lowering speeds varying from a creep to 10 fpm at full load and 90-psi air line pressure. Length of lift is 8 feet



and the hoist operates with either a one-hand control bar or remote pendent control.

The axial-piston compressed-air motor assures positive starts and stops and prevents motor burnouts during stalls, according to the manufacturer.

A centrifugally governed, fully mechanical brake prevents slippage. When the air supply fails or maximum lowering speed is exceeded, the brake is said to permit the operator to retain control of the hoist while lowering the load.

The hoist weighs 100 pounds and is equipped with swivel-mounted safety suspension and load hooks. Hook-to-hook dimension is 23½ inches.

Accessories for the hoist include trolleys for the hoist and air hose, a chain basket with a 20-foot capacity, filter-regulator-lubricator, and a nonsparking kit to adapt the hoist for operation in explosive atmospheres.

Gardner-Denver Co., Keller Tool Div., Dept. C&E, 1300 S. Front St., Quincy, Ill.

Circle No. 71.

New, exclusive cab-forward design

One of 9 reasons why contractors find International Trucks cost least to own!

Compact, new cab-forward INTERNATIONAL Trucks feature *low*, full-size cabs for convenient access to save drivers time and effort . . . short turning radius with bumper clearance for easier maneuvering even in tightest quarters.

These new INTERNATIONALS have more powerful engines in every model—more *usable* power at low rpm to keep operating and maintenance costs low. They haul bigger legal loads with improved weight distribution, with less over-all length.

As you would expect, new cab-forward INTERNATIONALS are quality-built from the rugged bumpers to the end of the sturdy frames . . . built to do a truck job better, longer, for less.

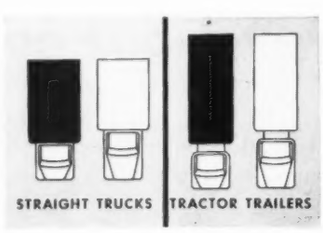
And INTERNATIONAL Trucks cost *least* to own—cost records prove* this. Let your INTERNATIONAL Dealer show you today.

*Signed statements in our files, from fleet operators throughout the U.S., back up this statement.

INTERNATIONAL HARVESTER COMPANY, CHICAGO

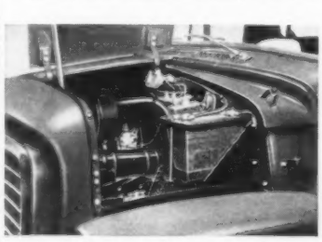
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

1 Longer legal payloads with ideal 89-inch bumper-to-back-of-cab dimension. Full size, unobstructed cab has 61-inch full-width seats, no wheelhousings. Only 3¼ inches higher than conventional models. Easier, more convenient entry and exit.



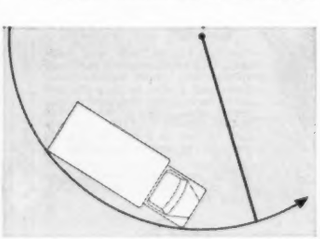
2 Bigger payloads with better weight distribution. More load space than conventional trucks with same over-all length—or the same load space with shorter over-all length. Easier to drive and maneuver. Safer, too, with better all-around vision.

3 Lively, low cost performance with INTERNATIONAL-built engines that produce more *usable* horsepower at low rpm. Higher compression ratios for greater efficiency and economy. 12-volt ignition with "hot spark" circuit. Engines for every job.

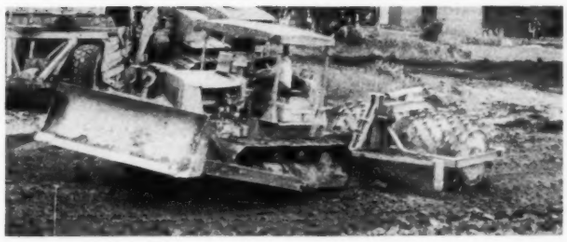


4 Superior engine accessibility saves time and money. Large side opening hood permits complete freedom to all engine compartment components. Master cylinder, battery and most frequently serviced units are conveniently located.

5 Low first cost. New INTERNATIONAL cab-forward models are priced right down with the lowest. They are quality-built throughout to keep operating and upkeep expense at rock bottom. Result: they are built to cost *least* to own over the years.



6 Minimum front overhang and true geometric steering for short turning radius with bumper clearance. Cam and roller-mounted twin lever gears are mounted ahead of the front axle. Comfortably positioned four-spoke, safety steering wheel.



The Bros level blade attachment on this sheepsfoot roller allows the contractor to grade and compact in one operation.

Grading and compaction one job with attachment

Subgrade compaction became a profitable operation for the J. K. Hodgman Construction Co. when a Bros level blade attachment was combined with a tamping roller on an excavation job. The Fairmont, Minn., firm reported these savings on a Class C grade excavation project between Hutchinson and Winthrop, Minn.:

By combining grading and rolling in one operation, the contractor eliminated patrol grader rental costs and a grader operator's wages on the 40-day project. In addition, the three scrapers on the work averaged from 2 to 3 extra loads per hour because runs were made on the leveled grade in high gear rather than a lower gear.

Compaction tests showed that densities obtained by the blade-roller combination varies between 106 and 116 Standard Proctor, well above the specified 98 per cent centerline and 95 per cent shoulder densities required. These compaction results were actually equal to those achieved on the job by a standard giant tamping roller with 756-psi foot pressure, according to the contractor.

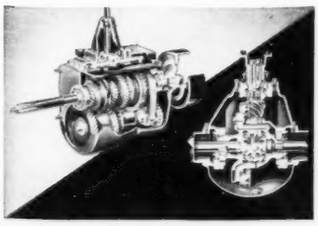
The Bros blade-roller was also used to maintain horizontal stockpiles of the old roadbed materials. These were picked up by the scrapers and stockpiled along the right-of-way for reuse during subbase construction. By consolidating these materials with the blade-roller, the contractor freed a dozer to work on another job.

For further information on these level blade attachments, write to Bros, Inc., Dept. C&E, 1057 Tenth Ave., Minneapolis 14, Minn.

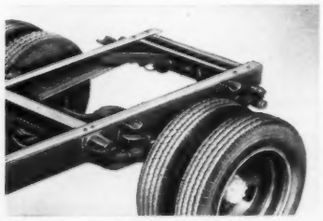
Circle No. 50.

New INTERNATIONAL cab-forward design . . . shown here is the Golden Anniversary model ACF-182 six-wheeler. Better weight distribution with short 96-inch bumper-to-back-of-cab dimension. More *usable* power in every model.

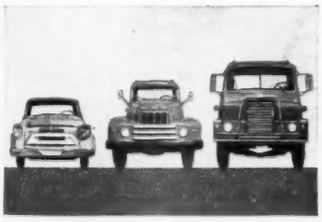
Other new cab-forward INTERNATIONALS from 9,000 lbs. GVW including 4-wheel and all-wheel-drive haulers. You name the construction job . . . INTERNATIONAL builds the trucks that will do it better, longer, at *least* cost.



7 **Choice of transmissions** and rear axles assures you the proper capacity and final drive ratios to match the engine power, your load and road conditions *exactly*. You save on fuel. You get superior on-the-job performance and extended truck life.



8 **Steel-Flex frames** combine great strength without excess weight. Non-crystallizing cold squeezed rivets are used throughout for extra rigidity and proper flexibility. Factory-built drop-frame models are available to reduce loading time and effort.



9 **World's most complete line.** There is an INTERNATIONAL "tailor-made" for every truck job, ½-tonners to 96,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own.

For more facts, use Request Card at page 18 and circle No. 325

New anchorage unit for stressing tendons

A concrete prestressing system which uses cold-formed heads to provide positive end anchorage for high-carbon, steel-wire stressing tendons is offered by The Prescon Corp. The system is said to replace older methods which provide anchorage by means of friction grips or threaded bars.

Reported advantages of the Prescon system, in addition to the headed-wire method of anchorage, are that tendons, bearing plates, and stressing shims are custom made to meet the requirements of a specific structure; wires are measured with fixed stops to insure exact duplication of length; tendons are delivered complete with end bearing plates attached; and a hydraulic jack is the only equipment needed to apply stress.

A workman places a stressing shim behind the Prescon stressing washer, which is held by a pneumatic jack.

The Prescon system is recommended for use in prestressing girders, columns, and beams; flat-plate lift slabs; buttresses; pipe-support beams; circular and rectangular slabs; roof decks; and other members.

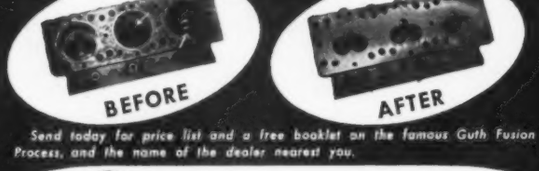
The Prescon Corp., Dept. C&E, P. O. Box 4071, Corpus Christi, Texas.

Circle No. 80.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

DON'T THROW AWAY CRACKED DIESEL CYLINDER HEADS

You can save 50% of replacement cost with Factory Rebuilt Guth Company Heads. The Guth Company restores cracked or worn heads, blocks, transmission cases to a Guaranteed good-as-new condition by the Guth fusion process . . . successfully used for more than a Quarter Century.

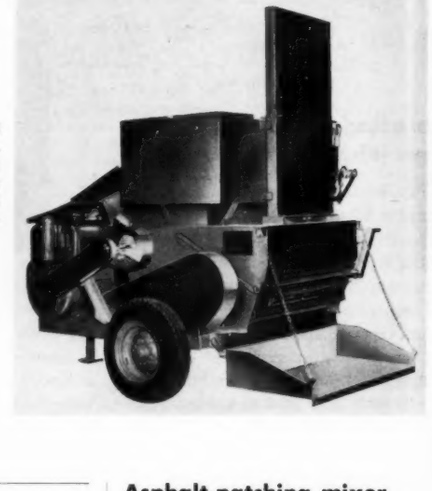


Send today for price list and a free booklet on the famous Guth Fusion Process, and the name of the dealer nearest you.

GUTH COMPANY
McPHERSON, KANSAS

SERVING THE NATION FROM ITS CENTER

For more facts, use Request Card at page 18 and circle No. 326



With a mixer capacity of 8 cubic feet, the McConnaughay HTD mixer No. 8 is large enough for many resurfacing jobs as well as for all types of pavement patching.

Asphalt-patching mixer has 1/3-ton capacity

Designed for use with asphalt cements, cutbacks, emulsions, or tars, the McConnaughay HTD No. 8 mixer is available with or without a 200-gallon asphalt supply tank. Large enough for many resurfacing jobs as well as for all types of pavement patching, the No. 8 has a mixer capacity of 8 cubic feet. The aggregate bin is marked for volumetric measuring.

The unit features a low-pressure burner and power-driven asphalt pump and counter. It weighs 3,800 pounds, measures 10 feet 4 inches in width, and 9 feet 6 inches to the top of the stack with extension attached.

McConnaughay Mixers, Inc., Dept. C&E, 424 Columbia St., Lafayette, Ind.

Circle No. 57.

New jack can be used vertically, horizontally

A 100-ton hydraulic jack which can be used horizontally is announced by Duff-Norton Co. The jack, weighing 225 pounds, can be used either vertically or horizontally because the oil is sealed in reservoirs. It stands 12 inches high and has a power raise of 6⅛ inches.

A tandem pump permits rapid engagement of the load. The ram is brought into quick contact with the load by actuating both high-speed and high-lift plungers. The load can be lifted easily using only the high-lift plunger.

Dual release valves in the base of the jack can be operated from either side. The base is drilled and tapped for a pressure gage, which is optional.

Duff-Norton Co., Dept. C&E, Preble Ave., Pittsburgh 30, Pa.

Circle No. 34.

Heavy-duty trucks feature new cab design

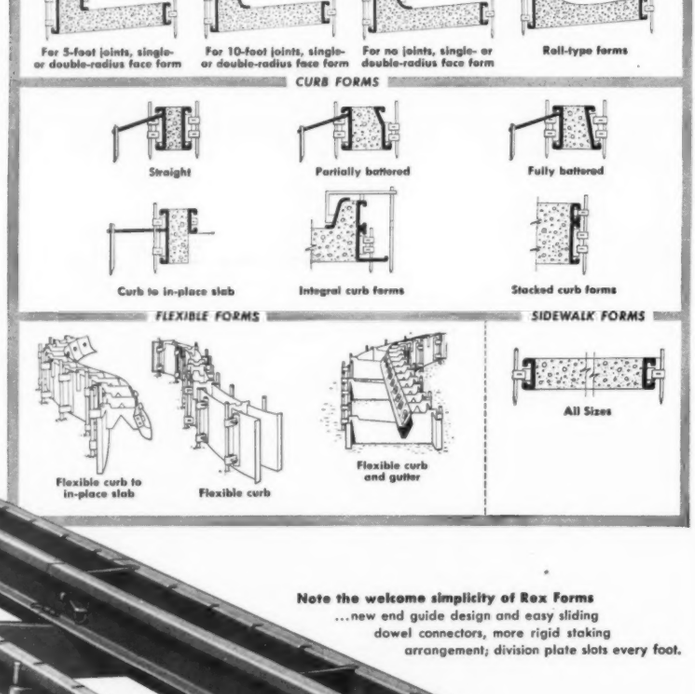
A new addition to its line of heavy-duty vehicles is announced by Reo Motors, Inc.

Called the B-Series diesels, these units feature the firm's comfort and safety-engineered driver's cab with slant-back windshield and full-sweep

What do you need in curb and gutter forms?

REX®

has it ...and fast!



Note the welcome simplicity of Rex Forms ...new end guide design and easy sliding dowel connectors, more rigid staking arrangement; division plate slots every foot.

Here is the simplest, fastest forming yet! Watch your jobs pick up speed and pay extra profits with newest designed Rex Forms.

Simpler setups are assured with many advanced Rex features. You get consistently better results...and with far less handwork.

Rex Steel Forms are built in handy 10-foot sections of durable, high-strength special alloy steel, all welded. They're re-usable...saving you money over the years.

Here is the most selective range ever offered...for *all* work: combination curb and gutter, curb, flexible, sidewalk.

You'll be ahead with Rex fast service, too. You get what you want when you need it. Phone your Rex distributor and see...or write CHAIN Belt Company, 4666 West Greenfield Ave, Milwaukee 1, Wisconsin.

New...for you!

Just printed, this complete new guidebook of modern steel forms. Has a world of help...pictures, descriptions, application data, specifications. See your Rex distributor for your copy, or write for all-new Bulletin 57-163.

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PAVERS • SPREADERS • FINISHERS • FLOATS • CURING MACHINES • FORMS

CHAIN BELT COMPANY

MOTO-MIXERS • BUILDING MIXERS • PUMPCRETE • RAILPORTER • PUMPS

For more facts, use Request Card at page 18 and circle No. 327

A choice of 9 Cummins heavy-duty diesel engines are offered in the Reo B-Series.

vision. The cabs come in either steel or lightweight aluminum. Both four and six-wheel chassis models in the B-Series are available in steel or in lightweight versions that have many weight-reducing aluminum or magnesium components and structural parts. The flexibility of cab and chassis construction in the B-series, plus a wide range of available options, make these units well suited for big load operations or rugged off-highway jobs requiring custom tailored trucks, the manufacturer reports.

The Reo B-Series line consists of: three 4×2 and four 6×4 trucks; 3 off-highway trucks; and 6 tractor models. The single axle units are engineered for gvw's to 42,000 pounds and the tandem axle units up to 63,000 pounds. The B-Series tractor models are designed for gross combination weights of 65,000 to 85,000 pounds.

A choice of nine Cummins' heavy-duty diesels are offered in the Reo B-Series, with horsepower ratings ranging from 175 to 335.

Reo Motors, Inc., Dept. C&E, Washington Ave., Lansing 20, Mich.

Circle No. 67

Lightweight winches have 4-ton capacity

New lightweight winches with a rated lifting capacity of 8,000 pounds are announced by the Braden Winch Co. Designated the MS3 and MSU3 Series, these models are said to include many of the best features formerly reserved for the firm's medium-duty and heavy-duty winches.

Incorporated into the new models are such engineering improvements as larger base angles that provide heavier load capacity. These are now secured by heat-treated capscrews to increase their shear strength.

The internal thrust ring in the housing has removed all lateral motion from the bearing leg by placing pressure at a point of greater strength.

Underslung winches with 8,000-pound rated capacity are also available in the MSU3-10 and MSU3-10F Models. MSU3-10 is especially suited for back-of-cab mounting on ½, ¾, and 1-ton trucks equipped with tanks, dump bodies, or other equipment mounted on the frame, while the MSU3-10F is said to be particularly useful for pulling light-duty trucks when traction fails.

Braden Winch Co., Dept. C&E, P. O. Box 547, Broken Arrow, Okla.

Circle No. 116.

TYING WIRE? **Speed YOUR Job with Ideal Reel**

and do it SAFELY ! *at less* COST !

FOR BRIDGES, DAMS, CULVERTS, FLOORS, WALLS, AND OTHER JOB APPLICATIONS.

High Production Increase with IDEAL Reels

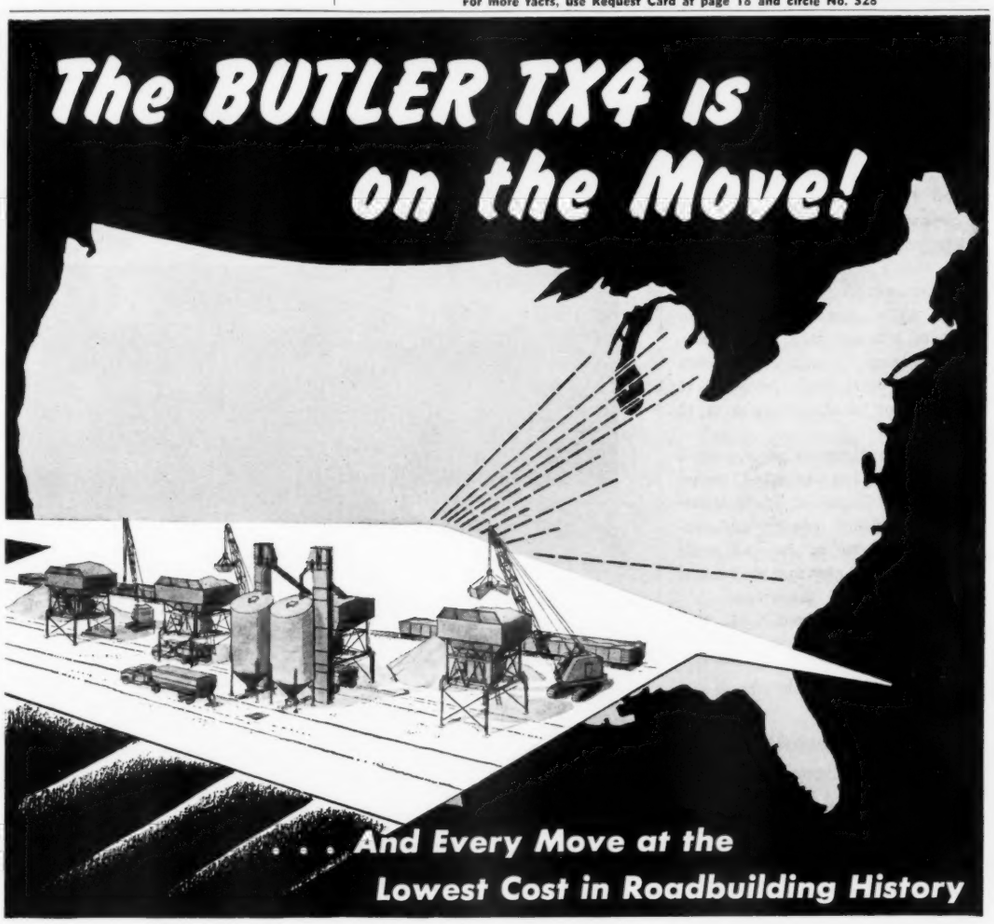
	Ties Per Min. with Ideal Reel	Ties Per Min. Using Shoulder Roll	Percentage of Increase
MAN X	1st Try 20	16	25%
	2nd 20	14	42.8%
	3rd 23	16	43%
MAN Y	1st Try 29	21	38%
	2nd 27	22	22%
	3rd 27	21	28.5%
MAN Z	1st Try 23	18	28%
	2nd 24	18	33.3%
	3rd 24	16	50%

AVERAGE INCREASE, 34.4%

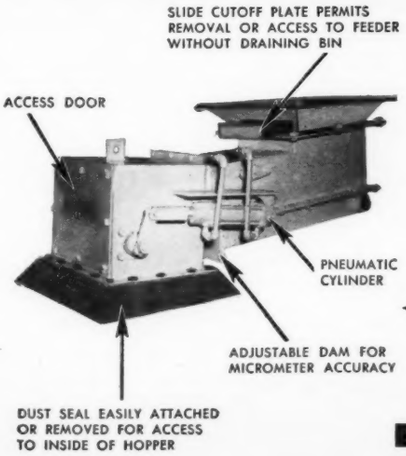
Have you seen IDEAL reel in action? If not, call your nearest dealer for a free demonstration or clip this ad to your letterhead and mail to **IDEAL REEL COMPANY,** Paducah, Ky., for full details.

For more facts, use Request Card at page 18 and circle No. 328

The BUTLER TX4 is on the Move!



. . . And Every Move at the Lowest Cost in Roadbuilding History


SLIDE CUTOFF PLATE PERMITS REMOVAL OR ACCESS TO FEEDER WITHOUT DRAINING BIN
ACCESS DOOR
PNEUMATIC CYLINDER
ADJUSTABLE DAM FOR MICROMETER ACCURACY
DUST SEAL EASILY ATTACHED OR REMOVED FOR ACCESS TO INSIDE OF HOPPER

The BUTLER TX-4—the Plant that grows with you

Basic setup handles one or two dual drum pavers. Easily expanded for 3 and again for 4 pavers. Completely automatic batching with only one operator . . . Fully interlocked against overweight or underweight. Depending upon the number of batchers used — the BUTLER TX-4 easily handles 2, 3, or 4 batches every 20 seconds at each bin.

And the TX-4 is the world's most portable plant. Dismantles and re-erects in a few hours instead of days. Bin section and batchers each ship in one piece. All wiring and air piping are in place ready for quick-connectors. Cuts your moving cost to a small fraction, let's you bid successfully yet make a greater profit.

The New BUTLER AIRFLOMATIC Cement Feeder

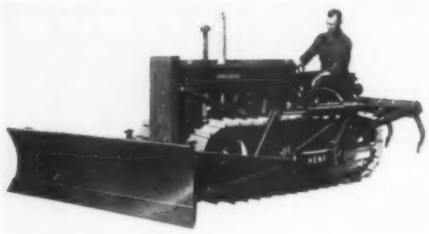
Your cement in the TX-4 rides smoothly, positively and accurately on a cushion of air. The most modern, trouble-free and efficient cement feeding mechanism ever developed.

Send today for the BUTLER TX-4 Bulletin. Fully illustrated. Completely describes the plant and all components. Just send a postcard. Ask for Bulletin TX-4.

BUTLER BIN COMPANY

971 BLACKSTONE AVE. • WAUKESHA, WISCONSIN

For more facts, use Request Card at page 18 and circle No. 329



The Henry Model ATD-1 angle-tilt dozer angles 25 degrees to right or left and tilts to 9 inches. The ATD-1 is designed for use with the John Deere 420 crawler tractor.

Push beams are mounted outside on new dozers

A newly designed bulldozer is announced by the Henry Mfg. Co. for use with the John Deere 420 crawler tractor. The two models available are the angle-tilt dozer ATD-1 and straight dozer SD-1.

Both dozers are designed with box steel push beams outside-mounted to prevent springing blade edges, with the beam pivot point placed below the center line of the tractor for increased traction.

The cutting edge of the blade is reversible and replaceable, and a specially curved moldboard rolls dirt ahead for maximum yardage per horsepower, the manufacturer states.

The angle-tilt blade is 96 inches long, with a 24-inch-high moldboard and 6-inch-high cutting edge. The Henry ATD-1 angles 25 degrees to right or left and tilts to 9 inches. Double-acting $3\frac{1}{2}$-inch cylinders shove the blade to a depth of 10 inches below grade, or raise it 52 inches.

The straight dozer blade digs to a depth of 15 inches and lifts 42 inches above ground level. It is 72 inches long, with height measure and materials the same as for the angle tilt blade. Large pins and replaceable bushings are used throughout.

Henry Mfg. Co., Dept. C&E, 1700 N. Clay St., Topeka, Kan.

Circle No. 88.

Heavy-duty wrenches are available in new sizes

Nine new sizes have been added to the OTC line of heavy-duty box-end wrenches, the Owatonna Tool Co. announces. The wrenches are designed for use on all heavy-duty construction equipment.

The tools are forged from high-alloy steel, fully heat-treated and machined for perfect size fit. The 12-point, accurately broached openings are designed to eliminate spreading or slippage under extreme pressure.

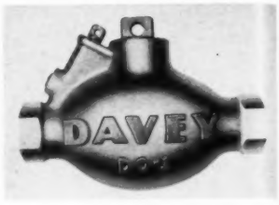
Sizes of the entire OTC heavy-duty box-end wrench line range from $\frac{3}{4}$-inch opening through $3\frac{1}{2}$ inches. All are obtainable in the straight handle series and with handle extensions. Most are available in the 15-degree offset or double offset series.

Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn.

Circle No. 20.

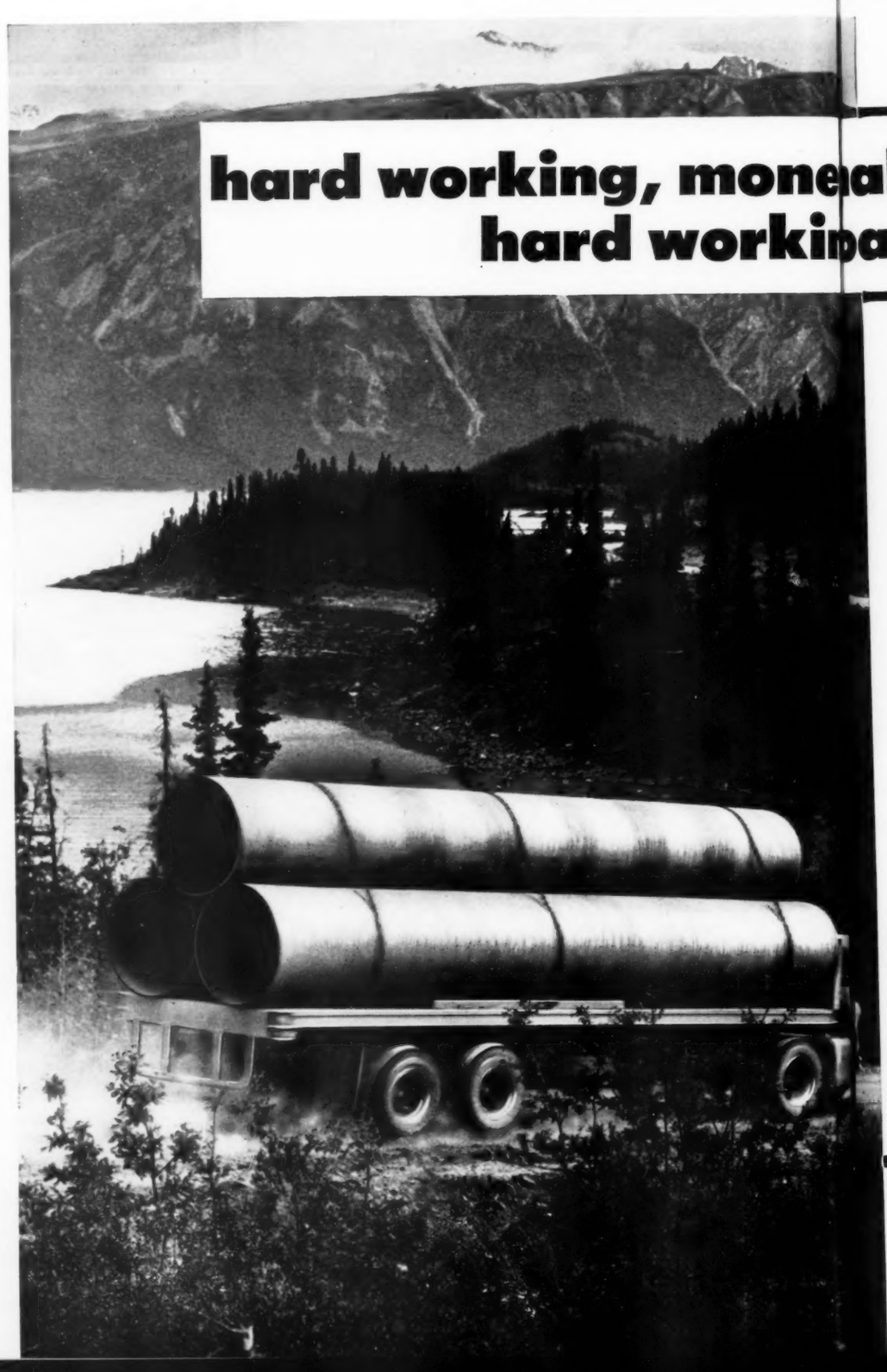
For more facts on these products, circle the indicated number on the Request Card at page 18.

Cast aluminum oilers use drop-in-pressure theory



A new series of line oilers for air tools and rock drills is announced by Davey Compressor Co. Designated Models DO-1, 2, 4, and 8, their capacities range from $\frac{1}{2}$ pint to 2 quarts. Their use is said to eliminate lubrication troubles.

The new Davey oilers operate on the drop-in-pressure principle. When the air tool throttle is closed, the air hose and oiler oil chamber build up to maximum line pressure. Then, when the throttle is opened, line pressure in the hose drops slightly and reducing pressure in the oil chamber carries oil through the suction tube into the air hose. This assures the furnishing of ample oil at the start of tool opera-



tion, after which an even flow is transmitted.

A needle valve provides precision control of the amount of oil fed to the tool. The valve can be adjusted with a screw driver even while tool is in operation. According to the manufacturer, there are no working parts and nothing to wear out, and the oilers operate efficiently in any position. The oilers are made of cast aluminum; weights from 3¾ to 9 pounds.

Davey Compressor Co., Dept. C&E, Franklin Ave., Kent, Ohio.

Circle No. 46.

The Model 9-15 Lightning Load Lifter is a hydraulically controlled unit that can be installed on any flat truck, or transferred from one truck to another, in just one hour, according to the manufacturer. Powered by a Wisconsin 8.2-hp Model AEN engine, the unit has a full 180-degree swing, with a maximum primary boom capacity of 1,500 pounds. The maximum reach of the fully extended boom is 10 feet from the edge of an 8-foot truck bed. In the photo, the Lightning Lifter is being used to trench, load and stack 30-inch concrete pipe. **H & M Mfg. Co., Inc.**, Dept. C&E, 109 N. Main St., Ottawa, Kans. **Circle No. 60.**

...making tools of the ...roadbuilder

FRUEHAUF TRAILERS
"ENGINEERED TRANSPORTATION"

Wherever roadbuilding contractors are hard at work — and earning top profits — Fruehauf construction Trailers are at work for them.

Reliability isn't the only reason why. Versatility — of the entire Fruehauf line and every Trailer in it — further explains the overwhelming preference. And in the end, it's *extra payload delivered* that makes Fruehaufs the roadbuilder's biggest cost saving, money-making equipment investment.

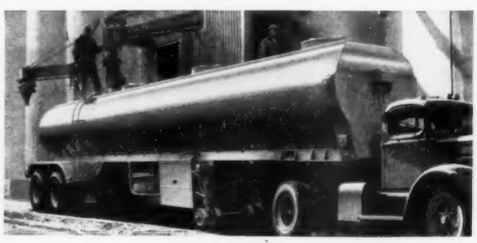
Any kind of roadbuilding Trailer you use — platforms, dumps, carryalls, or cement tanks — can be found in the complete, "Payload Engineered" Fruehauf line, available with convenient Fruehauf Finance terms, and all ready for *immediate delivery!*

A FULL LINE OF FRUEHAUF ROADBUILDERS

◀ **Platforms of All Types**

Cable, Hoist, and Hopper Dumps

Removable and Stationary Gooseneck Carryalls



Screw and Airslide Cement Tanks

World's Largest Builder of Truck-Trailers
FRUEHAUF TRAILER COMPANY
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CITY _____ STATE _____

The Efficiency Of Your Fruehauf Fleet Is Part Of Your Roadbuilding Profit!

Two-way radio setup aids ready-mix sales

Clemente Bros., Inc., Troy, N. Y., has found two-way radio a valuable tool in tightening delivery schedules and in selling transit-mix concrete service to new customers. "Whenever we mention our radio to a contractor," says Frank Clemente, "we find that our chances of getting the order are improved considerably."

The company negotiated a contract with the General Electric Communication Products Department for installation of a remote-controlled base station and 15 mobile units.

"Before radio," Clemente declared, "our trucks were scattered all over on various jobs. It was difficult to keep in touch with what was going on.

Radio's costs are tangibly written off in Clemente's operations through constant daily use, in coordination of movements of trucks between batch plants and construction jobs. Signals have been worked out to cut radio chatter to a minimum and to enable the company's dispatcher to efficiently handle the firm's expanding business.

"Time means money to contractors," Clemente says. "When the mix manufacturer achieves efficiency and economy, the contractor can't help but benefit."

Clemente Concrete Co.'s General Electric communication system enables truck drivers to keep in touch with the concrete batch plant.

For further information on this two-way radio equipment, write to Communications Products Dept., General Electric, Dept. C&E, Electronics Park, Syracuse, N. Y.

Circle No. 61.

← For more facts, use coupon or circle No. 330

This model of the Martin FT3 series of heavy-duty equipment trailer features a folding gooseneck which, when lowered, forms its own ramp over which equipment is driven directly onto the trailer platform.

Offer line of 3-axle equipment trailers

Three new series of 3-axle heavy-duty equipment trailers are announced by the Martin Machine Co. Kewanee, Ill.

The three styles include the RT3 series, a conventional-type rear-loading trailer with either a level or drop platform; the FT3 series, a front-loading folding gooseneck trailer; and the RFT3 series, a front and rear-loading folding gooseneck unit with either a level or drop platform.

Standard models in the three styles are available with capacities of 32, 40, 50, and 60 tons. Special 3-axle trailers are available with capacities up to 100 tons.

All units are equipped with the Martin rubber-mounted 3-axle suspension designed to distribute the load equally on all three axles.

The FT3 series and the RFT3 series feature the Martin folding gooseneck which, when lowered, forms its own full-width ramp over which equipment is driven directly onto the trailer platform. A winch-equipped truck tractor lifts the folding gooseneck into towing position. One man can load or unload the trailer in five minutes, according to the manufacturer.

Martin Machine Co., Dept. C&E, South and Thomas Ave., Kewanee, Ill.

Circle No. 107.

V-8 power unit produces 155 hp using natural gas

A V-8 model power unit is announced by the Construction Equipment Division of International Harvester Co.

The new 8-cylinder unit Model UV-549 can be operated on gasoline, natural gas, or LPG.

The unit has a 66-hp rating at 2,600 rpm, using gasoline and LPG, and produces 155 horsepower with the same rpm using natural gas.

This addition to the IH line has a compression ratio of 6.9 to 1, using gasoline, and 8.5 to 1 with LPG and natural gas. Displacement is 549 cubic inches, with bore and stroke of $4\frac{1}{2} \times 4\ 5/16$ inches.

International Harvester Co., Construction Equipment Div., Dept. C&E, 180 N. Michigan Ave., Chicago, Ill.

Circle No. 70.

New tool fires drivepins into steel, concrete

Twin-Master, a new powder-actuated tool with interchangeable barrels for driving ¼-inch and ⅜-inch pins into concrete and steel, is announced by Omark Industries.

The barrels allow pin positioning for maximum and minimum power, and are said to be quick and easy to

The Twin-Master is a powder-actuated tool with interchangeable barrels for firing ¼ and ⅜-inch drivepins into steel and concrete.

... with construction's best-proved torque converter tracto
... backed by 17 years of on-the-job experien
... thousands of profit-tested production mode

More efficient dozing—Matched engine-converter-transmission team lets operator choose speed range for each job as he starts ... finish most jobs without further clutching or shifting (except for reverse). With full control at throttle, he can work safely and efficiently regardless of terrain.

Faster on tough scraper jobs—These Allis-Chalmers tractors multiply torque up to four and a half times ... develop maximum drawbar pull when it's needed most ... start the load smoothly regardless of material in the cut ... automatically accelerate to the highest speed that conditions permit.

Nothing like 'em on big loading j... 3-yard HD-16G and 4-yard HD-21... shovels are tough, mobile, flexible ... pay big dividends on many projects... tors can crowd surely and steadily ... out stalling, shifting gears or losin... of the bucket because of slow engin...

...onger life ...torque ... ...ock and ... ...e entire tr... ...eat—mou... ...ss downtin... ...etter profi...

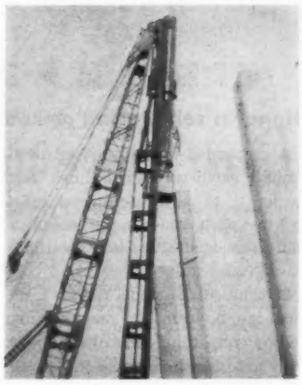
change. Breech plugs permit firing .22 or .25-caliber powder loads.

The Twin-Master is made of special alloy steels, has a polyvinyl hand grip, and chromium plated housing. It weighs 6¾ pounds and has an overall length of 14 inches.

Omark Industries, Dept. C&E, 9701 S. E. McLoughlin Blvd., Portland, Oreg.

Circle No. 53.

Greatly reduced downtime, considerably briefer setup time, and its suitability for use with a light model crane are advantages the W. F. Brinkley & Son Construction Co., Inc., Granite Quarry, N. C., has found in using a Model D-12 Delmag diesel pile hammer to drive precast concrete piles. In five months of continuous driving, only two hours of downtime held up hammer operations. Moving and setup time were reduced an estimated 30 per cent over that required for most hammers. A ½-yard truck crane and conventional leads were used on this job. For more information on Delmag diesel pile hammers, write to the **Foundation Equipment Corp.**, Dept. C&E, 100 Elizabeth St., Newcomerstown, Ohio. **Circle No. 73.**



New flexible coupling features rubber tire

A new flexible coupling is announced by the Dodge Mfg. Corp. The ability to handle angular misalignment, parallel misalignment, and end-float, in any combination, is one of the advantages claimed for the coupling. The flexible member is also said to cushion shock loads and diminish torsional vibration, protecting both the operator and the machine.

The coupling consists of a flexible tire clamped between two hubs which are mounted on the shaft to be coupled. The flexible member is held between the flanges and clamp rings of the hubs.

Both hubs of the coupling are machined to take Taper-Lock bushings. These are said to give the equivalent of a shrunk-on fit and to permit quick and easy application to shafts of different diameters without reboring.

The tire has a transverse split molded into it which reportedly permits easy installation and makes replacement possible without moving operator or machine. To make a change it is only necessary to loosen the cap screws enough to allow removal of the tire and to fit a new one in place, the manufacturer states.

Because there is no metal-to-metal contact in the Para-flex coupling, it requires no lubrication. The couplings are available in capacities up to 600 horsepower at 900 rpm.

Dodge Mfg. Corp., Dept. C&E, 1944 S. William St., Mishawaka, Ind.

Circle No. 81.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.

No construction equipment dealer in your area knows torque converter tractors as well as your Allis-Chalmers dealer. See him . . . and get the benefits of 17 years' experience working for you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Engineering in Action

onger life for big equipment—Hydrau- torque converter cushioning reduces ock and vibration on the power train, e entire tractor and its auxiliary equip- ent—mounted or drawn. That means ss downtime, more production time . . . tter profit protection on any job!

For more facts, use Request Card at page 18 and circle No. 331

Digger is self-storing on roof of truck

A suspended-type, completely hydraulic earth-boring machine, said to dig 11 to 22-inch-diameter holes to 7 feet deep, and at any angle up to 90 degrees, is announced by the Highway Trailer Co.

Designated the Model B digger, the unit can be front or rear-mounted on any type of line construction body, with any type of hydraulic derrick, according to the manufacturer. When not in active use, the unit is self-storing on the roof of the truck.

The machine, with drive chain crowd assembly said to assure rapid and smooth downward digging action, is designed to dig in every type of soil including frost and hardpan. Two independent hydraulic motors rotate the auger and power the feed mechanism. Both are reversible.

The digger unit is suspended from a derrick swivel, permitting complete freedom of movement, and the new machine can be positioned so that the derrick is free for pole-setting operations. On completion of a boring or pole-setting operation, the digger hydraulically retracts to carrying position on the roof of the truck.

This new suspended-type completely hydraulic earth-boring machine, manufactured by the Highway Trailer Co., can dig holes 11 to 22 inches in diameter, to 7 feet deep, and at any angle up to 90 degrees.

Highway Trailer Co., Dept. C&E, 405 E. Fulton St., Edgerton, Wis.

Circle No. 113.

Front-end loaders for wheel tractors

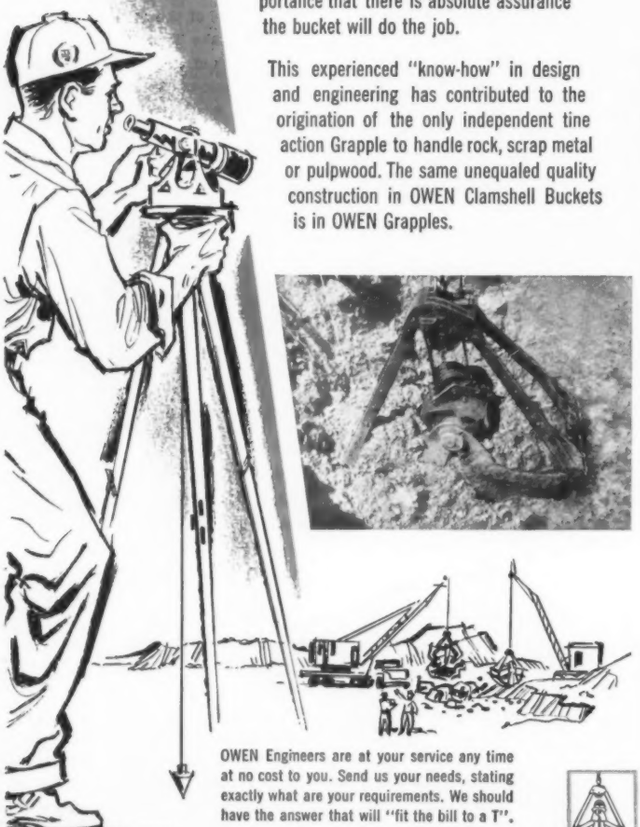
A new line of wheel-tractor-mounted front-end loaders is announced by Superior Equipment Division of Superior Pipe Specialties Co. According to the manufacturer, these units are especially designed for efficient, economic material handling.

The loaders feature a new extra-strong tubular frame, part of which acts as a hydraulic oil reservoir.

You can't set your sights too high

For digging . . . for handling material . . . for any clamshell work—OWEN Buckets perform giant size jobs day in and day out. OWEN'S designing and engineering experience, gained through 50 years of manufacturing Clamshell Buckets exclusively, has developed a product that is guaranteed to out-perform any other make. Remember—the bucket is the working end of the boom and it is of the utmost importance that there is absolute assurance the bucket will do the job.

This experienced "know-how" in design and engineering has contributed to the origination of the only independent tine action Grapple to handle rock, scrap metal or pulpwood. The same unequaled quality construction in OWEN Clamshell Buckets is in OWEN Grapples.



OWEN Engineers are at your service any time at no cost to you. Send us your needs, stating exactly what are your requirements. We should have the answer that will "fit the bill to a T".

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

For more facts, use Request Card at page 18 and circle No. 332

How to get better slabs . . . faster, cheaper

"Our Master Screed is a one-man-gang. It does everything at once, faster than we've done it before. We've upped our schedules and really cut our costs."

General contractors and road builders say that, because *in one time over*, the Master Vibrating and Finishing Screed strikes off, vibrates and compacts—from top to bottom—even the lowest slump concrete, making a denser, stronger slab than any other way we know of.

It eliminates honeycomb and form work on bridge decks, molds the concrete in crowns, arcs or flat for roadways and *cuts 'way down on finishing time for any slab.* This cost-cutting, top-quality screed is inexpensive and economical to operate. Available with arc or flat. See your Master distributor today for complete information.

Retractable Wheels Standard Equipment On Vibratory Screed

Screed in operating position. When lever is up, screed rests on work surface, ready to go. Gives high speed strike-off, compaction, and finish.

Lever down, screed beam up, ready to roll easily for another pass. Special retractable lightweight flange wheels increase mobility, step-up operating speed.

MASTER
MASTER VIBRATOR COMPANY
155 Stanley Avenue • Dayton 1, Ohio

For more facts, use Request Card at page 18 and circle No. 333

The Superior Model H228 front-end loader for wheel tractors features bucket rams that cannot spring. This unit has a 2,070-pound normal lift capacity.

Bucket rams are mounted so that they cannot "spring", and hydraulic piping is inclosed in loader arms for protection.

The loaders are said to have especially strong pry-out action for heavy or frozen loads. They can be mounted on most models of low-silhouette four-wheel industrial tractors. Attachments include a ½-cubic-yard utility bucket, a 6-foot crane boom attachment, a 9-cubic-foot standard materials bucket, and a 1-cubic-yard snow bucket.

Available models include the H228, with 2,070-pound normal lift capacity to full height, and the H215 and H115, both with 1,510-pound lift capacity.

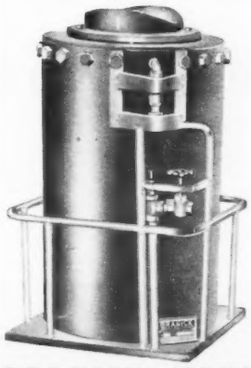
Superior Equipment Division, Dept. C&E, P. O. Box 341, Wheeling, Ill.

Circle No. 173.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

LIFTS 9 TONS

IN SECONDS — POWERED BY 160 LBS. OF AIR LINE PRESSURE



BRANICK'S

AIR-OPERATED

EARTHMOVER JACK

The EARTHMOVER JACK lifts Earthmovers and Extra Heavy Equipment, quickly and handily for tire and repair service. Jack can raise (from 25") to full height of 44" in 20 seconds. Equipped with valve stem for earthmover tire chuck and small stem adapter. Screw type needle valve gives complete control for holding and releasing air. Shipped assembled, ready to operate.

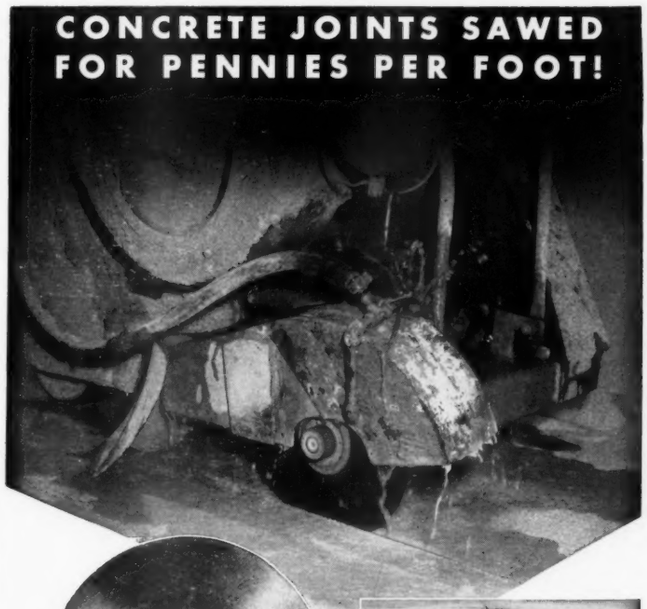
Only $287.50 fob factory

BRANICK MANUFACTURING CO., INC.

2600 Third Avenue — Fargo, North Dakota

For more facts, use Request Card at page 18 and circle No. 335

CONCRETE JOINTS SAWED FOR PENNIES PER FOOT!



Sawing road joints to control cracking is now required in 19 states.

BAY STATE'S NEW REINFORCED ABRASIVE BLADES give you tremendous advantages in economy. Actual experience on both highway and airport jobs shows costs per inch foot of cut between 1½ and 6 cents, depending upon the aggregate.

Specifically designed for wet cutting in green concrete, KRETE-KUT and SAF-T-CUT BZ2 blades are available immediately in all four thicknesses normally required by contracts. The standard 14" diameter readily handles all the depths usually specified, and arbor holes are made to fit each of the popular concrete saws.

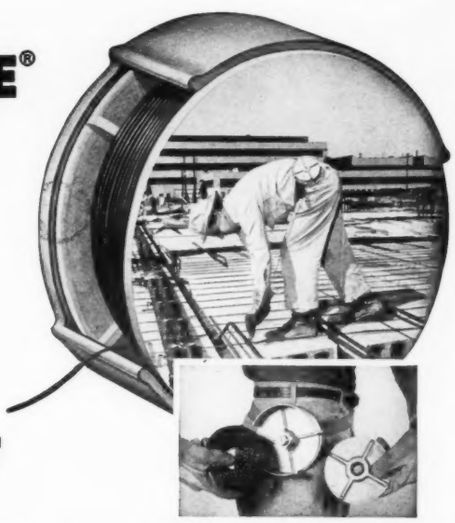
Testing KRETE-KUT and SAF-T-CUT BZ2 is the best way to get the lowest concrete cutting costs! Contact your local BAY STATE DISTRIBUTOR, or write to us in Westboro for details.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U.S.A.

For more facts, use Request Card at page 18 and circle No. 336

CAL-TIE® WIRE in the handy reel dispenser



safe to use...

Cal-Tie Wire in the handy reel dispenser makes concrete reinforcement tying jobs safer because there's no old-fashioned shoulder coil to throw workers off balance... no awkward coil to catch on protruding objects ... no danger of eye injuries... no scratches on neck or ears to become infected... and Cal-Tie Wire has a smooth, even surface.

easy to use...

Workers prefer to work with Cal-Tie Wire in the handy reel dispenser. They like the safety... its compactness and lightness... the way it doesn't cramp them when they're working in tight places... the way it eliminates tiresome treks to get a new coil to replace the partially-used one they had to abandon to do other work.

Contact your nearby CF&I representative today for the complete story on this safe, easy and modern way of tying concrete reinforcement bars.

CAL-TIE WIRE

THE COLORADO FUEL AND IRON CORPORATION

4245

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Oklahoma City • Phoenix • Pueblo • Salt Lake City • Wichita
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CF&I OFFICE IN CANADA: Toronto • CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

For more facts, use Request Card at page 18 and circle No. 334

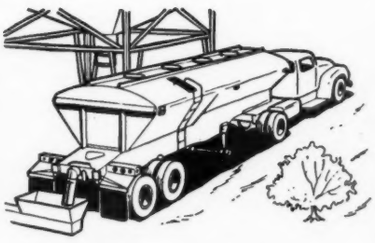
There's a Trailmobile Trailer for every

Trailmobile offers a single source of supply for every type of "heavy construction" trailer along with factory service facilities in 54 cities from coast to coast. Beyond this, many of Trailmobile's construction features were designed with time saving "on-site" maintenance in mind. All trailers are available on convenient financing up to five years for qualified buyers. For further information on new or used equipment, write Trailmobile Inc., 31st and Robertson, Cincinnati 9, Ohio.

highway construction need

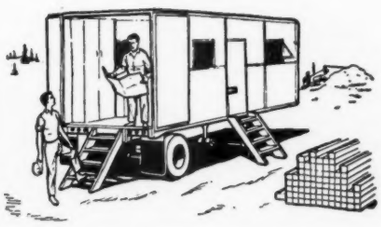
TRAILMOBILE LOW BEDS

. . . are used to deliver heavy road building equipment to the job area. Steel shovels, bull dozers and other large tractor-treaded units can be easily transported on these powerfully built trailers.



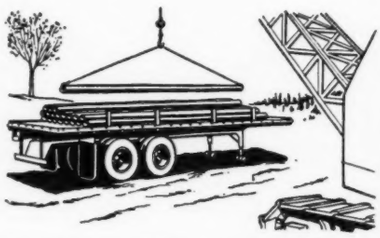
TRAILMOBILE CEMENT BULKERS

. . . transport large amounts of bulk cement to mixing plants at the job site. Both steel and aluminum types offer exclusive step-down design with twin screw discharge.



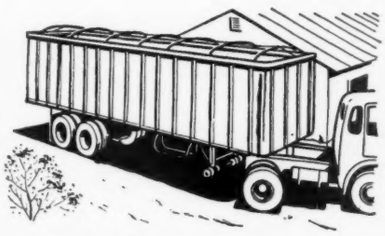
TRAILMOBILE FREIGHT VANS

. . . combine weather protection and mobility for hauling general supplies. Low cost used vans provide ideal job site offices, tool shops or storage facilities.



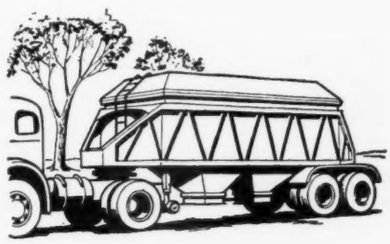
TRAILMOBILE PLATFORM TRAILERS

. . . are used for carrying lumber, cement forms, drainage tile, straw bales and sundry light equipment. "Sideless feature" permits simpler, faster loading and unloading.



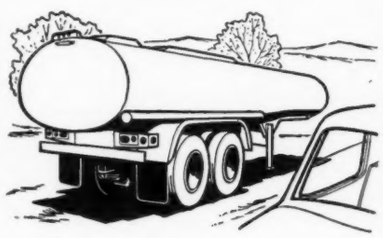
TRAILMOBILE OPEN TOPS

. . . are extensively used for carrying tools and construction materials. These units can be equipped with tarpaulin roof covers to protect contents against sun, rain or snow.



TRAILMOBILE HOPPER TRAILERS

. . . are used for carrying and spreading aggregate, gravel and sand. Bottom discharge permits uniform spreading of contents over a wide area.



TRAILMOBILE TANK TRAILERS

. . . are widely used for hauling hot asphalt, road oils, and the great volume of water required at the site. Most units carry a unique guarantee against tank leakage.

TRAILMOBILE HYDRAULIC DUMPS

. . . provide big capacity in a dump-type trailer for hauling and unloading sand and gravel. Unusually rugged construction guards against costly out-of-service time.

TRAILMOBILE INC.

Subsidiary of Pullman Inc.

Cincinnati 9, Ohio • Berkeley 10, Calif. • Springfield, Mo. • Longview, Texas

Sales and Service from Coast to Coast

TRAILMOBILE INC.
31st & Robertson
Cincinnati 9, Ohio

Please send me further information on the trailer types I have indicated below:

- ☐ Low Beds
- ☐ Platform Trailers
- ☐ Cement Bulkers
- ☐ Tank Trailers
- ☐ Freight Vans
- ☐ Hydraulic Dumps
- ☐ Open Tops
- ☐ Hopper Trailers

NAME_____

COMPANY_____

STREET_____

CITY_____ STATE_____

For more facts, use coupon, or Request Card at page 18 and circle No. 337

Diamond T's Model 831 is available with a wide choice of transmissions, auxiliary transmissions, rear axles, and wheelbases.

New truck is fast, and powerful

Described as particularly well suited to construction work is the Diamond T Motor Car Co.'s recently announced Model 831.

With a gross vehicle weight of over 30 tons and appropriate tandem rear axles, the 831 is powered by a Hall-Scott 590 engine.

Both gasoline and LPG models have 6 cylinders, with the gasoline model developing 239 brake horsepower at a governed speed of 2,800 rpm. Compression ratio of the latter engine is 6.7 to 1. The LPG engine is said to develop 256 brake horsepower at the same governed speed, with a compression ratio of 8.7 to 1.

Among the many features designed to insure long vehicle life and a minimum of maintenance on the gasoline-powered model, according to the manufacturer, are a 15-inch clutch and the Spicer 6452 five-speed transmission, which has direct drive in fifth. The same transmission is available on the LPG 831, although a Spicer 14-inch 2-plate clutch is standard on that version.

The 831 is available with a complete range of tandem rear axles in a comprehensive choice of ratios.

The company states that reports from the field indicate the new model is effecting substantial savings in time and operating costs, as well as carrying larger payloads than other trucks of comparable size.

Diamond T Motor Car Co., Dept. C&E, 4401 W. 26th St., Chicago 23, Ill.

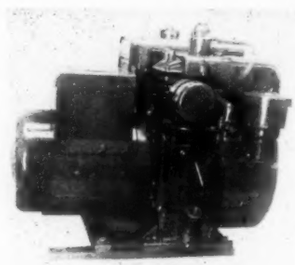
Circle No. 63.

Compact electric unit develops 1,500 watts

A self-contained electric plant of small size is announced by the Universal Motor Co. Designated Model 31-B, and said to be especially suited for portable service, the plant develops 1,500 watts at 110 volts ac, in a unit taking less than 2 square feet of space.

Powered by a heavy-duty, one-cylinder, air-cooled engine, the 31-B features an oversize generator and two twist-type outlet receptacles for connecting lights, appliances, or power tools. All electrical equipment is completely closed for safety and protection.

Push-button starting is another feature of the plant. A special 12-volt winding on the generator acts as a starter and also provides 300 watts at 12 volts dc for battery charging.



The plant comes complete and ready for operation, and requires no installation, according to the manufacturer.

Universal Motor Co., Dept. C&E, 624 Universal Drive, Oshkosh, Wis.

Circle No. 118.

SHEAVES?

WE MAKE 'EM BIG, LITTLE and BEST!

CAST IN CARBON OR FARRELL'S "85" STEELS WITH Cable Saver Grooves

WRITE FOR LITERATURE TODAY

FARRELL-CHEEK STEEL COMPANY
SANDUSKY, OHIO

Finest Name in Cast Steel

For more facts, use Request Card at page 18 and circle No. 338

drilling for the highways of tomorrow

When it's better to be safe than sorry, engineers investigate underground conditions. And, that's exactly what this Acker TH drill is doing — drilling test holes over a walled-up section of the old Erie Canal preparatory to building an overhead express highway.

For low-cost, dependable sub-soil information, try an Acker on your next job. Several models available with power and type of mounting to best serve your requirements.

Write today for prices and Bulletin 30, C&E.

ACKER DRILL CO., Inc.
725 W. Lackawanna Avenue
Scranton, Penna.

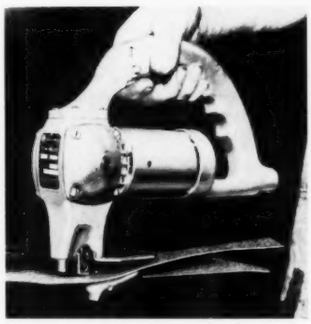
a complete line of Diamond and Shot Core Drills, Drilling Accessories and Equipment

For more facts, use Request Card at page 18 and circle No. 339

Announce new shear with 30 fpm capacity

A new No. 16 shear introduced by The Black & Decker Mfg. Co. is said to make fast, easy cuts in all types of sheet metal and wire netting. Powered by a cool-running Black & Decker-built motor that has a patented armature design for long heavy-impact service, the shear will cut through cold rolled steel at speeds up to 30 fpm.

The shear, which cuts sheet metal up to 16-gage thickness, is designed with a one-piece shoe contoured to indicate the correct cutting angle, and constructed to permit cutting to a small radius. Quick blade adjustments



will adapt the tool to different material thicknesses.

A shear by its action will necessarily curl a thin piece of metal in a trimming operation, but the manufacturer points out that an exclusive deflector-plate on the Black & Decker shear prevents curling and eliminates other possible fouling of material. The handle is designed to be gripped in many different positions for either guiding or pushing, with sufficient room to accommodate a large, gloved hand comfortably.

Weight of the new No. 16 shear is only 6¾ pounds.

Black & Decker Mfg. Co., Dept. C&E, E. Pennsylvania Ave., Towson 4, Md.

Circle No. 170.

Power steering assembly for two tractor models

A power steering assembly for factory or field installation on the firm's Model 420 utility and 420 special utility industrial tractors is announced by Deere & Co.

The unit includes a hydraulic cylinder located between the tractor front-end support and a special heavy-duty steering arm.

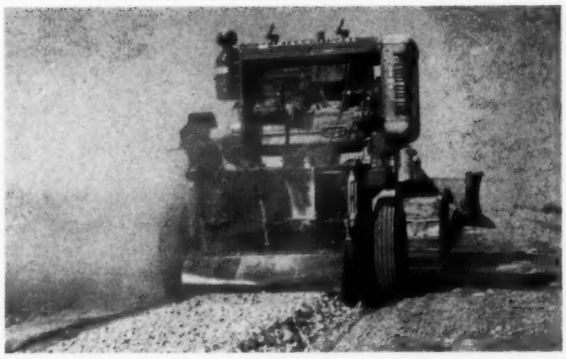
When the tractors are furnished with power steering they are equipped with extra heavy-duty, non-adjustable tie rod assemblies. These assemblies are included in power steering attachments for field installation.

Deere & Co., Dept. C&E, 3300 River Drive, Moline, Ill.

Circle No. 111.

For more data on any item, circle indicated number on card at page 18.

For more facts, circle No. 340→



Designed to eliminate costs incurred through use of a crushing plant and unnecessary re-handling of material, the self-propelled BMCO Rock Buster processes oversized rock and pit-run materials right on the road bed. Old rough asphalt can be scarified, windrowed, and reclaimed with speed and efficiency. Crushing is said to be consistently uniform throughout an entire job. **Browning Mfg. Co.**, Dept. C&E, P. O. Box 2702, San Antonio 6, Texas. **Circle No. 31.**

More time for OUTPUT with Bucyrus-Eries

Here's profitmaking quality in action. With a Bucyrus-Erie excavator, you get more working time each hour of every shift — more daily output — because:

It stays on the job. It's built tough. Quality materials provide strength, durability, and all-weather stamina. Parts are simple, large, few in number — there is little that can go wrong. Machinery is arranged simply, compactly so that maintenance can be handled quickly with little downtime. It's easy to keep a Bucyrus-Erie going at top speed. Exceptional synchronization of speeds and power assures smooth, well balanced work cycles . . . fast, responsive control.

If that's the kind of steady, output-building pace you'd like on *your* job, see your Bucyrus-Erie distributor soon for all the facts on excavators from ⅜- to 4-cu. yd. capacity. For full information on larger machines, write us direct.

321E57C

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

A new type of mucker belt, especially designed for conditions met in the 37,500-foot Poe Tunnel project in California, has carried two-thirds of the more than 900,000 tons of rock excavated in that project. Manufactured by the B. F. Goodrich Co., the new belt features interior fabric reinforcement designed to distribute shock loads from impact, improve cover adhesion, and reduce stretch. The new construction provides its own cushion against load impact since the belts operate across a steel slider bed which affords no additional cushioning protection. For further information about these mucker belts, write to the **B. F. Goodrich Co.**, Dept. C&E, 500 S. Main St., Akron, Ohio. **Circle No. 94.**

Lightweight compactor produces heavy impact

Its Terrapac Model CK 10 vibratory soil compactor is announced by Vibro-Plus Products, Inc.

Designed as a companion to the Models CH 30 and CM 20, the unit weighs only 1½ tons, yet is said to produce a 5-ton impact due to a unique combination of vibratory frequency and high amplitude. According to the manufacturer, lower vibration frequencies mean less wear and tear on the unit, sharply reducing maintenance problems.

Heavy-duty, dustproof bearings are used in the machine, and special shock absorbers isolate the drum from the frame to prevent destructive vibration from being transmitted to the gasoline engine or battery.

Highly maneuverable, the CK 10 may be towed by the smallest rubber-tire tractor to within 1½ inches of walls and abutments, the manufacturer states. A twin scraper bar keeps the drum clean when rolling forward or backward.

Vibro-Plus Products, Inc., Dept. C&E, P. O. Box T-368, Stanhope, N. J.

Circle No. 103.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

Offer low-bed trailer for heavy equipment

A heavy-duty low-bed trailer with removable gooseneck, said to permit one man to load or unload heavy construction equipment quickly and easily off the front end in busy, congested areas, is announced by the La-Crosse Trailer Corp.

Instead of employing hydraulic or cable lifts ordinarily used on removable gooseneck trailers, the trailer bed is raised and lowered by a ramp rear-mounted on the tractor. Two standard fifth-wheel couplings—one on the tractor and one on the front deck of the trailer—are used to attach the gooseneck to trailer and tractor.

In unloading, the front of the trailer is lowered directly to the ground by releasing the tractor fifth-wheel and slowly driving the tractor forward. Two hinged gooseneck stir-

The NEW
JACKSON VIBRATORY COMPACTOR

HAS MUCH MORE POWER and SPEED . . . UNMATCHED ADAPTABILITY TO JOBS OF ALL TYPES!

Here's the machine that will give you maximum density of all materials normally used in macadam base courses and sub-bases with the greatest economy and convenience.

It's a vastly improved version of the Jackson Multiple Compactor which was used with great success on virtually all the nation's important paving projects. It is much more powerful and faster, providing time-saving, full course, single pass compaction. And unmatched as it is for quick and easy adaptability to jobs of all types, it will handle each of them with greatest convenience and least lost motion. Moreover, with this machine you can get into places others can't touch. By all means see your nearby Jackson Distributor (name on request) about this machine or write to us for the complete facts before buying any compactor.

ANY ARRANGEMENT DESIRED OF VIBRATORY UNITS IN THE WORKHEAD TO FIT THE JOB MOST ADVANTAGEOUSLY IS QUICKLY AND EASILY ACHIEVED.

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

6 UNITS ABREAST FOR MAXIMUM COVERAGE

6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION

4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS

5 UNITS IN TANDEM AND STAGGERED. VARIABLE FOR A WIDE RANGE OF WIDTHS.

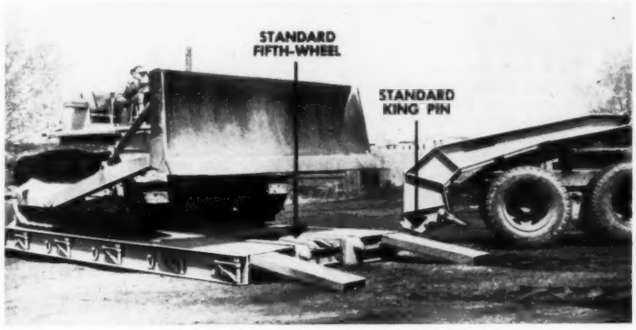
4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.

SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.

AND FOR SPOTS OTHERS CAN'T REACH.

Any of the compacting units in the Jackson Vibratory Compactor workhead can be fitted with operating handle and used exactly like the nationally renowned Jackson Manually Guided Compactors. Perfect for getting into odd spaces and close to walls, etc. — spots that can't be reached by other equipment. One man with a twin hookup of two of these units will compact up to 1,200 sq. yds. of granular soils in 6" layers per hour.

For more facts, use Request Card at page 18 and circle No. 341



The LaCrosse removable gooseneck trailer incorporates a fifth-wheel kingpin connection between gooseneck and trailer to simplify alignment and facilitate loading and unloading of heavy equipment in congested areas, without need for hydraulic and winch arrangements.

rups are then raised and the tractor is again backed under the gooseneck. The tractor kingpin is then relocked and after the trailer kingpin has been released, tractor and gooseneck are driven forward so equipment can be unloaded off the front-end of the trailer. The reverse procedure is followed after the trailer has been reloaded.

This system is said to completely eliminate the need for sheave and cable arrangements, and to assure positive control of gooseneck at all times, whether hooked or unhooked from the trailer. Winch assistance is necessary only when tractive effort is not sufficient to raise trailer and load into travel position, according to the manufacturer.

The units are available in 25 to 50-ton capacities, with tandem walking-beam or spring-mounted running gear, and up to 75-ton capacity with the LaCrosse triple-axle design. The company also offers a choice of flat-bed, drop-side, or beam deck models, and a pair of 4-inch skids is included with each trailer for loading shovels, rollers, pavers, and other heavy equipment.

LaCrosse Trailer Corp., Dept. C&E, 418 Gould St., LaCrosse, Wis.

Circle No. 95.

New treatment helps reduce spalling

A new spray-on concrete protective treatment with a chlorinated rubber base is available from Speed-O-Laq Products. Designated Speed-O-Laq 4014 Concrete Clear Coat, the treatment is said to be equally suitable for both new and old concrete. It seals, cures, and hardens concrete, coats it to an average depth of ⅛ inch, and dries in 30 to 60 minutes.

According to the manufacturer, the treated surface has a 95 to 98-degree water retention and becomes impervious to oils, greases, salts, and mild acids, reducing the possibility of spalling. Speed-O-Laq 4014 can be sprayed on immediately after troweling and is said to give good surface uniformity, with an average coverage of 500 square feet per gallon.

Speed-O-Laq Products, Dept. C&E, St. Paul, Minn.

Circle No. 6.

Offer new improvements in excavator controls

Further improvements have been made in the remote-control system on the Warner & Swasey Co.'s multipurpose Gradall, the firm reports.

The control panel in the operator's cab has been redesigned, and temperature and oil pressure gages have been added to tell the operator at a glance if the carrier engine is functioning properly. A red light indicates whether the generator is charging or discharging.

A new positive-action air cylinder which handles the power shifting of the undercarriage is operated by means of a dial mounted on the panel. The cylinder is employed only when the remote-control system is being used.

The deadman safety brakes are automatically set should a failure develop in the air-pressure system, and air-electric controls are said to give instantaneous response.

The system is now standard equipment on the self-propelled wagon model Gradall and is optional on the 6×4, 6×6, and carrier models.

Warner & Swasey Co., Dept. C&E, 5701 Carnegie Ave., Cleveland, Ohio.

Circle No. 83.

ROADRANGERS
speed handling
45-ton payloads

This Fisher LOADMOR hopper train is 54' 6" long; has a GCW of 120,000 lbs. Reo V-8 Tractor is equipped with R-46 Fuller 8-speed semi-automatic ROADRANGER Transmission.

Where maximum payloads run up to 45 tons, Fisher Sand & Gravel uses 2 Reo Tractors equipped with 8-speed R-46 Fuller ROADRANGER Transmissions pulling double-bottom trains.

Says Bill Fisher, President: "The Reo V-8, together with the 8-speed Fuller ROADRANGER Transmission, give us ideal performance. The R-46 ROADRANGER is particularly suited to our operation because of the short length of the transmission, the even steps between gear ratios, and the lighter weight as compared to main transmission and an auxiliary or 2-speed axle. The faster shifts and the short even steps between gear ratios are a big advantage because of the high GCW on adverse grades. Each of the Reos has accumulated 70,000 miles of trouble free service."

Fisher Manufacturing, Inc. of Mt. Pleasant, Michigan, builds the double-capacity super-haul trailers used by Fisher Sand & Gravel Company, Midland . . . and markets them to other aggregate hauling firms as well.

Does your application call for an easy-shifting, shorter, lighter-weight, higher capacity transmission . . . with short even steps between ratios to keep engine rpm in the maximum hp range? Check with your truck manufacturer or dealer for the right Fuller ROADRANGER for your job, or write Fuller Manufacturing Company (Transmission Division) Kalamazoo, Michigan.

FULLER
TRANSMISSIONS

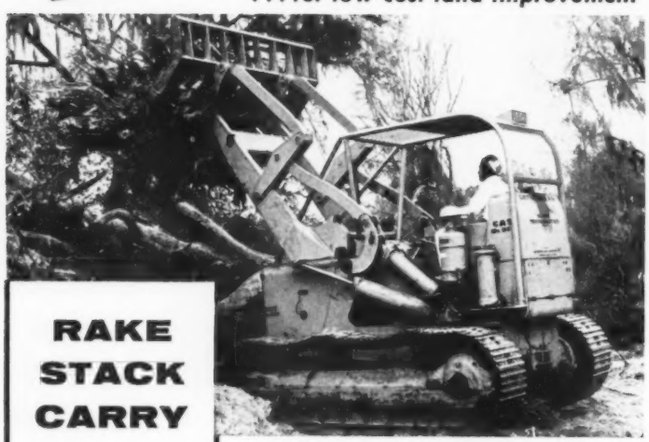
Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

For more facts, use Request Card at page 18 and circle No. 342

Recently announced by the Badger Machine Co. is this new digger-loader combination. The backhoe is the new Hopto Model 80 RTM 57, featuring a 180-degree swing, an 11-foot digging depth, and full hydraulic operation. The front end loader is the Badger Model 75, built for a loading height of 8 feet and 150-degree bucket tilt. Digger and loader may be mounted on several of the larger rubber-tire industrial tractors. For further information on this digger-loader combination, write to the **Badger Machine Co.**, Dept. C&E, 1122 W. 5th St., Winona, Minn. **Circle No. 87.**

FLECO®

. . . for low-cost land improvement



RAKE STACK CARRY

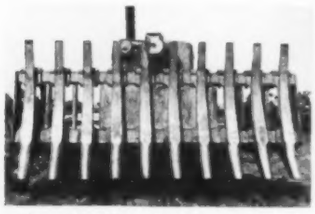
with the NEW

FLECO-TRAXCAVATOR RAKE!

Add a new dimension to your land clearing operations — and new usefulness to Cat No. 977 or 955 Traxcavators! In just a few minutes you can convert your Traxcavator into a highly efficient land clearing machine. You can *push* out rocks, stumps, roots and trees — carry the material to trucks or piles for disposal. You can rake out debris that interferes with compaction and scraper or grader work.

With Bumper Bar at high lift and forward tilt position, maximum leverage is provided for pushing trees over. Curved teeth comb roots and brush from the ground. Traxcavator tip-back lift arm feature tilts teeth to carry a full load and stack it, if desired, rather than push it along the ground.

Your Fleco-Caterpillar Dealer will gladly help you analyze your over-all land clearing operation and recommend the equipment you need most. See him for facts on Fleco-Traxcavator Rakes!



Fleco Multiple-Application Rake for the mighty D9 pushes out, rakes and stacks trees, roots, stumps, rocks.

Fleco Detachable Stumper concentrates power on stump. Knockdown beam hits tree high for maximum leverage.

FLECO CORPORATION

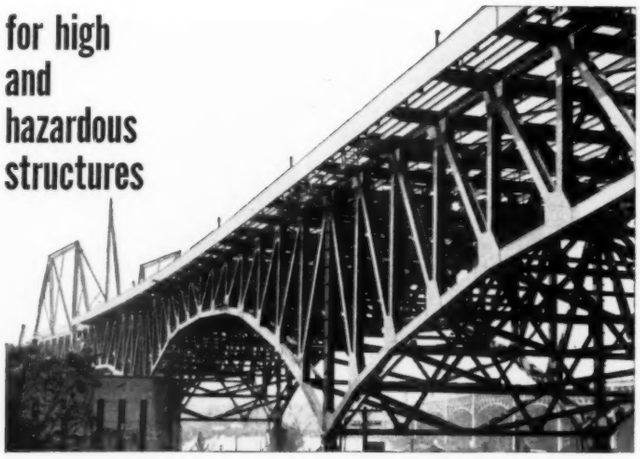
Jacksonville, Florida

ROCK, ROOT & BRUSH RAKES
TREE CUTTERS • UNDERCUTTERS
CAB GUARDS • ROOT CUTTERS
DETACHABLE & PULL STUMPERS
TREEDOZERS • ROLLING CHOPPERS
HEAVY-DUTY TOOL BARS

YEARS OF MANUFACTURING *1947* FLECO *1957* LAND CLEARING EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 343

for high and hazardous structures



Leave-in-Place

Steel Forms *for* concrete bridge decking

USF galvanized Steel Forms provide the industry's most practical solution for laying concrete bridge decking where removal of conventional forms would involve hazardous and expensive operations. All installation is completed from top side without special tools or equipment. They are *left in place* after concrete is poured, eliminating entirely costly erection and removal of shoring, catwalks and wood forms. The USF Steel Form is specifically engineered for this service, with more than adequate capacity to support the required amount of wet concrete.

Send for illustrated data sheet.

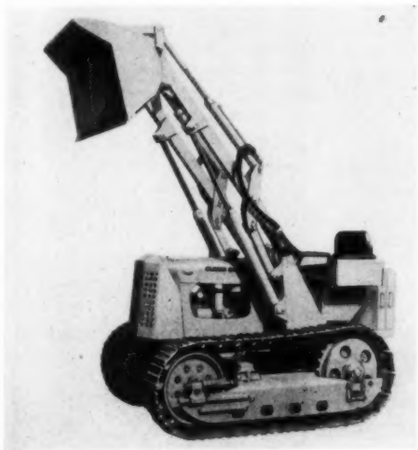
UNITED STEEL FABRICATORS, INC.

WOOSTER, OHIO

PRODUCTS
Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells • Highway Guard Rail • Bridge Flooring • Steel Forms for Concrete Bridge Floors • Corrugated Metal Pipe • Sectional Plate Pipe and Pipe Arches

For more facts, use Request Card at page 18 and circle No. 344

New loader features improved design



With new, low-silhouette design, the Oliver OC-46 tractor-loader with backhoe attachment features increased operator vision and greater load stability.

A high-speed digging and loading machine is now available in the new Oliver OC-46 loader with backhoe attachment. Built as a tractor-loader in one basic, compact unit with simplified trencher mounting, this work package features a 22-drawbar-hp engine with 4-speed transmission.

A major improvement in loader design is claimed by Oliver in the low-silhouette profile. New design has greatly reduced pedestal height, permitting exceptional operator vision as well as gaining greater loader stability. The new OC-46 has a ⅝-yard bucket with increased roll-back and dump angle, affording deeper penetration with more powerful break-out action than in previous models.

The crawler assembly has four lower track wheels and deep, full-length side panels to protect against damaging rocks. Track gage is 46 inches for maximum stability in high-speed, full-capacity loading.

Coupled with the Oliver Jet-Trencher, the OC-46 is reported to be a versatile machine. Hookup or removal of the trencher can be accomplished in just 90 seconds, the manufacturer reports. Fully hydraulic, the Jet-Trencher digs to 11 feet, loads to 8 feet 10 inches, and has a full 180-degree boom swing.

The Oliver Corp., Dept. C&E, 400 W. Madison St., Chicago 6, Ill.

Circle No. 51.

No clips, mastic needed with new joint sealer

Maximum protection against water leakage at control joints in cement block and masonry wall construction is claimed for Titewall, a new rubber control joint sealer available from Servicised Products Corp.

The double butterfly design of the material provides optimum water barrier efficiency, as well as permitting quick and easy installation, according to the manufacturer. Made of a synthetic rubber compound which is durable and elastic, Titewall is designed to be used with Servicised Kork-Pak pre-molded joint filler and a suitable joint sealer.

Due to its design and the resilience of the rubber, Titewall, once installed in the groove, remains in place without clips or mastic. The sealer is available in 8, 24, and 48-inch strips and lengths of 10 feet.

Servicised Products Corp., Dept. C&E, 6051 W. 65th St., Chicago 38, Ill.

Circle No. 40.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

Tachographs help cut down "lugging"

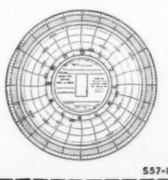
...lengthen engine life...save fuel!

The RPM Tachograph is a recording tachometer which gives your operators a constant guide for proper engine operation, flashes a warning light when predetermined control speed is exceeded, and provides supervisors with an accurate charted record to check operator performance. In addition to engine speed in RPM, the Tachograph chart records time, total engine revolutions, and OFF periods.

A small investment in an RPM Tachograph for every diesel engine you operate can pay big dividends by reducing costly "lugging."

Tachographs are easy to mount and position on the instrument panel, are ruggedly built and tamper-proof. Bulletin SU-107 tells the whole story—mail the coupon today.

Wagner Electric Corporation
6364 PLYMOUTH AVENUE, ST. LOUIS 14, MO., U.S.A.



Name and Position_____
Company_____
Address_____
City_____ State_____
We operate_____ Vehicles
(NUMBER)

557-10

For more facts, use coupon, or Request Card at page 18 and circle No. 345

Rome Disk Plowing Harrows

Rome Master Disk Plowing Harrow takes a deep cut, turning material over so that excess moisture can evaporate.

BUILD *ideal* SUBBASE
for roads, airports and dams

For faster, more efficient pulverizing, aerating, blending and stabilizing of subbase materials put a Rome Disk Plowing Harrow on your job! Here's the weight and design to cut deep — pulverizing action to thoroughly mix the subbase and return material to its original position — free from ruts or windrows — the ruggedness to match the power of the largest crawlers.

Rome Disk Plowing Harrows are ruggedly-built for heavy-duty construction work. Massive main frames hold gangs level and make them penetrate uniformly. Super-strong bearings — your choice of Timken Roller or White Hard Iron — hold blades rigidly in position, provide easy rolling action. Notched blades are the finest made to withstand the punishment of rocks and stumps. Rome Disk Plowing Harrows are available in a variety of widths, in both offset and Rome Master Tandem. You have your choice of mechanical, hydraulic or cable control angling methods as well as wheel-type offsets in certain sizes.

Get all the facts at your Rome-Caterpillar Dealers.

ROME PLOW COMPANY, Cedartown, Georgia

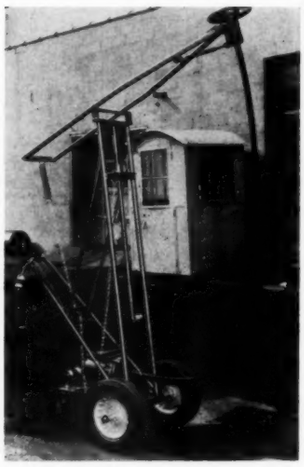
YOUR **ROME** DEALER IS YOUR **CATERPILLAR** DEALER

For more facts, use Request Card at page 18 and circle No. 346

Clyde Terry, an independent sweeping and maintenance contractor in Pico, Calif., uses a Conveyor Co. Mobil Sweeper to clean up after paving contractors on new construction of roads, streets, and other installations. His payment includes time required to travel to the job, but not the return trip; therefore, Terry finds the high travel speeds available with the Mobil Sweeper save him time and money. The variable speeds of the brooms enable the machine to dig out packed refuse at the curb line in one pass; by slowing the vehicle and increasing the speed of the brooms the operator can dig out the heaviest accumulation of dirt. For further information on the Mobil Sweeper write to **the Conveyor Co.**, Dept. C&E, 3260 E. Slauson Ave., Los Angeles, Calif. **Circle No. 59.**

Offer new machine for grinding ceilings

Stow Mfg. Co. offers a new and reportedly unique machine for grinding ceilings. The CG ceiling grinder is designed to finish ceilings on large jobs such as concrete apartment dwellings. With the CG grinder an operator can finish about 4,000 square feet a day of ceilings from 8 to 10 feet high.



Stow's CG ceiling grinder can grind about 4,000 square feet of concrete ceiling in a work day.

The grinding is done by a 9-inch fiber-backed disk driven by a ½-inch-wide×8-foot-long flexible tool shaft powered by a ¾-hp totally enclosed motor. The grinding disk usually operates at 3,450 rpm.

The height of the grinding wheel is easily raised and locked in position. A slight pressure is put on the grinding wheel by the spring and chain arrangement at the opposite end of the pivot arm. A turnbuckle is used to adjust the grinding disk to the flat position. A spring arrangement is built into the bearing housing supporting the grinding disk to absorb any shocks.

Stow Mfg. Co., Dept. C&E, 443 State St., Binghamton, N. Y.

Circle No. 174.

Offer chuck gage for safe tire inflation

A chuck gage said to comply particularly with care and safety recommendations for the mounting and inflation of tubeless tires is announced by A. Schrader's Son.

A length of hose with a chuck clip permits the operator to stand back as beads are seated in mounting tires, as recommended by tire companies and the Rubber Manufacturers Association, the company reports.

The gage unit is replaceable, and features single push-button control of inflating, gaging, and deflating. Calibrations range from 16 to 110 pounds.

A. Schrader's Son, Div. of Scovill Mfg. Co., Inc., Dept. C&E, 470 Vanderbilt Ave., Brooklyn 38, N. Y.

Circle No. 96.

BMCO
4 SPEEDS FORWARD — SELF PROPELLED — 4 SPEEDS REVERSE
PNEUMATIC TIRED ROLLER
LEADS the FIELD

ON ASPHALT
OR
ON BASE

YES! BMCO IS WAY OUT FRONT

- 4 speed Forward — 4 Reverse
- Torque Converter
- Automotive type "power" steering
- All wheels oscillate — insures better tire wear and more even compaction.
- Hydraulic reversing unit

See Your **BMCO** Dealer For A Demonstration Today!

BROWNING MANUFACTURING CO
111 HUMBLE AVE SAN ANTONIO, TEXAS

For more facts, circle No. 347

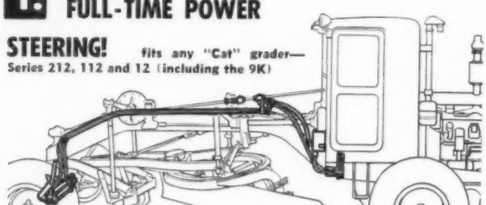
Rivinius

Less than $600.00 for BOTH GUARANTEED PERFORMANCE!

COST-CUTTERS FOR "CAT"

MOTOR GRADER WORK

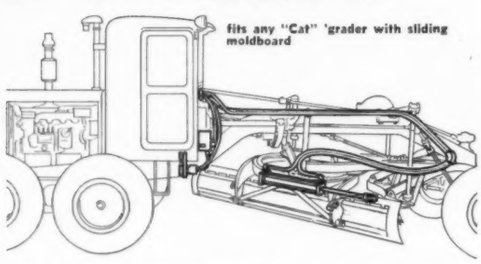
1. FULL-TIME POWER STEERING! fits any "Cat" grader—Series 212, 112 and 12 (including the 9K)



Less job time . . . better job quality—that's how Rivinius full-time power steering helps your "Cat" Motor Grader put extra dollars in your pocket . . . and here's why:

- Valve located high above dust and other terrain hazards
- Holds wheels automatically in any position, over any terrain
- Eliminates wheel whip
- Frees operator's hands for handling blade and other controls
- Fully hydraulic
- Easy to install
- Minimum of working parts
- Vickers pump

2. HYDRAULIC MOLDBOARD SHIFT



fits any "Cat" 'grader with sliding moldboard

- This separate Rivinius attachment can be teamed with Caterpillar or Rivinius Power steering—adding these features to your Caterpillar Motor Grader:
- Operator shifts moldboard from inside cab at the touch of a hand! Makes sure position is correct for every application. More effective work on insloping or backsloping.
- Functions whether 'grader is moving or stationary.
- Moldboard can be stopped—locks—at any point—operator no longer limited to five manual slot positions.
- Moldboard moves through full distance of travel in less than 20 seconds.
- Easy to install . . . minimum of working parts—operates from same pump as Power Steering.

Get complete facts about Rivinius Power Steering and Moldboard Shift from your Caterpillar dealer . . . or write:

Rivinius INC. EUREKA, ILLINOIS

For more facts, circle No. 348

New diamond coring bits offered in three sizes

Diamond Products, Inc. offers three sizes of diamond coring bits for use in building work or pavement test core work.

Three new lines of thin-wall diamond coring bits for use in maintenance, building, and general construction are announced by Diamond Products, Inc.

Used in regular portable drilling equipment, these diamond coring bits are said to replace jackhammer or carbide drilling equipment for drilling effortlessly through brick, granite, tile, or reinforced concrete aggregate. They are recommended for use in cutting holes in existing floors or walls for conduit and piping, or to extract test cores of highways or buildings for laboratory analysis.

Cement block is drilled at the rate of 1 fpm and reinforced concrete aggregate at 5 to 8 minutes per foot. Holes or cores are clean and neat, and cracking, chipping, or splitting is practically eliminated, the company reports. The bits are cooled with a water swivel and fit regular drilling equipment.

Marketed under the trade name Drillco, these bits include the 100 Series, for heavy-duty use, the 200 Series for medium-duty use, and the 300 Series, for lighter-duty use. All three types are available in sizes from ¼ through 6½-inch diameters.

Diamond Products, Inc., Dept. C&E, 420 Prospect St., Elyria, Ohio.

Circle No. 172.

Form permits monolithic pour in culvert work

A new steel form for the construction of culverts is announced by the Symons Clamp & Mfg. Co.

The culvert form is designed to connect Symons standard wall panels and slab panels so that a culvert can be poured monolithically. Since all units are prefabricated, no built-up forms or other special equipment is necessary, according to the manufacturer.

The culvert form is a 9×9-inch steel section which provides for a 3-inch face on the roof slab and on the wall, with a 45-degree-angle surface 8½ inches wide between wall and roof. It comes in lengths of 4, 6, and 8 feet and is produced for use with both metal frame and wood frame forms. Special size forms are also available.

The form, made of 11-gage hot rolled steel, can be re-used an indefinite number of times.

Symons Clamp & Mfg. Co., Dept. C&E, 4249 W. Diversey Ave., Chicago 39, Ill.

Circle No. 188.

POWER-PACK BACKFILLER

Patent No. 2,779,508

Speeds Road Building . . . Cuts Costs

The quick, economical method of spreading road shoulder material. Also backfills curbs and trenches. Contractors and highway departments all over the country are saving time, labor and material with the Power-Pack Hopper Conveyor. Plan with Power-Pack on your next road contract. Keep down backfilling costs and finish the job quicker. Write for full information today.

POWER-PACK CONVEYOR CO.
13910 ASPINWALL AVE. CLEVELAND 10, OHIO

For more facts, use Request Card at page 18 and circle No. 349

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

the VOLUNTEER

A POWERFUL NEW
COMMUNICATION RECEIVER
FOR YOUR
2-WAY RADIO SYSTEM

FM VHF

Expand the usefulness of your 2-way radio system by installing high performance VOLUNTEER Receivers in all vehicles not presently equipped with 2-way radio. Low cost VOLUNTEERS will permit you to page drivers or supervisory personnel in any area reached by your radio transmitter. Calls are acknowledged by public telephone—often saving hours of vital time.

VOLUNTEERS are designed by the manufacturer of the famous Pak-Fone 2-way Portable Radiotelephones so widely used in public security emergency communications.

Write or wire or phone AUstin 7-8888 for the name of your local dealer.

FEATURES
CAR AND HOME/OFFICE MODELS
15 TUBES (AC/150)
CRYSTAL CONTROLLED
EXTREME FRINGE RECEPTION
COMPACT—EASILY INSTALLED
FCDA APPROVED
25 to 55 MC—140 to 175 MC
CHROME STEEL CASE
AS LOW AS $99.00 (less crystal)

INDUSTRIAL ir RADIO CORP.
428 N. PARKSIDE AVE. • CHICAGO 44, ILL.

For more facts, use Request Card at page 18 and circle No. 350

Scottie McBlock takes a leaf from McKissick with his new custom designed outfit

"A BETTER BLOCK"
Custom Designed

BUILT TO FULFILL YOUR EVERY REQUIREMENT

Illustrated right: 250 Ton Twelve Sheave . . . equalizer Timken Bearing Tandem Block for 26 line reeving.

McKISSICK PRODUCTS CORPORATION
Box 2496 — Tulsa, Oklahoma

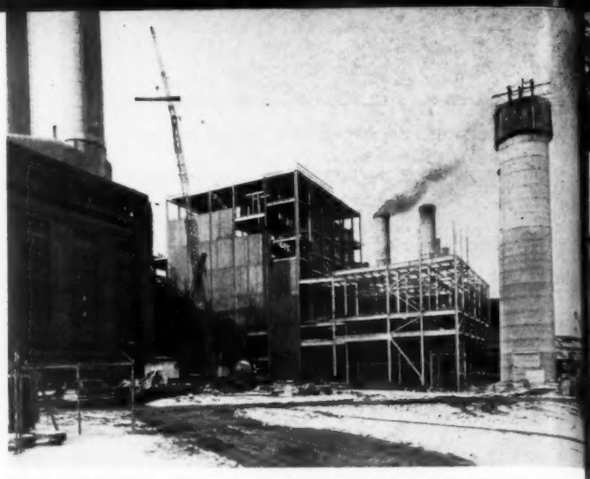
Write for complete McKissick Catalog

McKISSICK

For more facts, use Request Card at page 18 and circle No. 351

Construction camera

A diversion channel for the Squamish River in British Columbia is dug by a Lorain 85 shovel with a 2½-yard dipper that loads a 15-ton Euclid. This is preparatory work for the hydroelectric development on the Cheakamus River for the British Columbia Electric Co., Ltd., Vancouver.



The first of two new 200,000-kw units for the Huntley steam electric generating station of Niagara Mohawk in Tonawanda, N. Y., boasts the first use of the bolting technique in the Niagara area. Bethlehem Steel Co. is supplying 2,800 tons of steel for the structure.

Pa. department copes with summer problems

Now that hot weather is here, the Pennsylvania Department of Highways is turning its attention to two big summertime problems.

The concrete pavements that rose slightly during the recent heat wave because of a lack of room for expansion are currently under repair.

The second problem concerns the bituminous materials that melt on rural roads and splatter automobile finishes. The department's testing laboratory is advising motorists to rub the spots off with a rag and kerosene or gasoline. Bituminous materials that splash onto the underside of automobiles cause no damage and actually serve as a kind of undercoating.

Cement requirements and concrete durability topic of two new HRB bulletins

"Soil Series Cement Requirements" and "Durability of Concrete: Physical Aspects" are two bulletins available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

The first bulletin details 43 soil series tests by the pedological system developed by the U. S. Department of Agriculture. The authors of this paper found that the system was a reliable indicator of cement requirements for stabilization. This bulletin is priced at 50 cents.

"Durability of Concrete: Physical Aspects" is an annotated bibliography covering all major works on concrete durability. The bulletin includes all books published between 1837 and 1956. This bulletin is priced at $1.

Symons Clamp opens Midwest warehouse

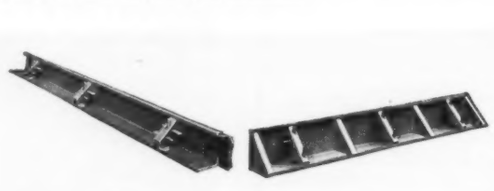
A 10,000-square foot warehouse has been opened in Kansas City, Kans., by the Symons Clamp & Mfg. Co., Chicago, Ill. Located at 64 Kansas Ave., the warehouse will carry a complete line of Symons prefabricated forms, column clamps, hardware, and other allied equipment for customers in Kansas, Nebraska, and South Dakota.

Here's the only Complete Concrete Paving Line with Experience depend on the BLAW-KNOX "Complete Package" for maximum profit

Only Blaw-Knox Concrete Speaders Spread with a Blade — the NATURAL WAY

Only the Blaw-Knox Concrete Spreader spreads concrete with an automatic transverse Blade — the only *natural way to spread concrete* since it handles even dry, harsh concrete with a minimum of segregation, spreads it evenly no matter where it is dumped on the grade, requires a minimum of operator effort and clears the way for forward motion of the spreader. The Spreader can be set to spread to form level or below form level with or without pre-installed center joint. The automatic reversing action of the spreader blade relieves lateral pressure so alignment of forms is never disturbed.

A vibratory attachment that operates off the spreader power unit can be added that will assure maximum density without segregation, even in dry, harsh concrete. Width of spreader easily adjusted to meet all paving requirements.

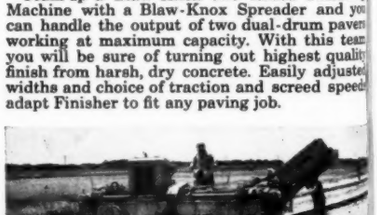


Self-Aligning Road and Airport Forms

Setting Blaw-Knox Self-Aligning Paving Forms true to line and grade is a cinch. Look at all the features that save time and money. Double-wedge staking system prevents tipping of forms by crooked stakes. One-piece lock-joint end slides give you fast aligned joints. Buttress-type stake pockets together with over-all sturdy construction of the forms prevent mis-alignment. Road forms are available in heights of 6" or more and Airport forms in heights of 12" or more.

Dependable Blaw-Knox Finisher

Team-up a Blaw-Knox two-screed Finishing Machine with a Blaw-Knox Spreader and you can handle the output of two dual-drum pavers working at maximum capacity. With this team you will be sure of turning out highest quality finish from harsh, dry concrete. Easily adjusted widths and choice of traction and screed speeds adapt Finisher to fit any paving job.

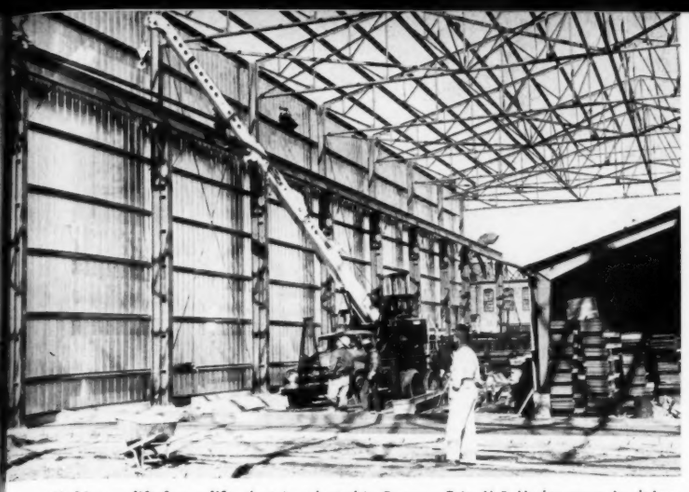


Blaw-Knox Precision Subgrader

Here's the only Subgrader that excavates by vibration — cutting through even the hardest subgrade to produce a perfect grade true to crown and cross-section. Fast and accurate, it produces more work with less power at a lower cost per square yard to assure accurate control of slab thickness to save concrete.

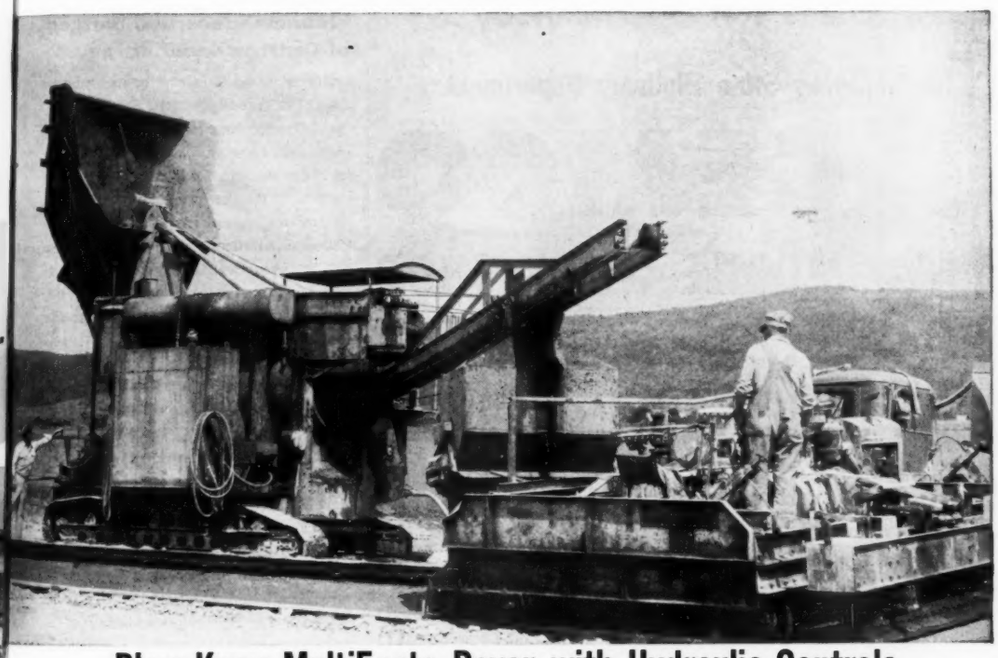
Fast Accurate Batching Plants

Blaw-Knox Aggregate and Cement Bins and Batching equipment are available to match the high capacity of all units in the Blaw-Knox Complete Package of Concrete Paving Equipment. Both Cement and Aggregate Batching Equipment are available with manual, push-button air-operated or automatic controls.



Making a lift for a lift—that is what this Bucyrus-Erie H-5 Hydrocrane is doing. The machine, working in a small and confined area of a new industrial building in Denver, Colo., is being used to place the rails for the plant's overhead traveling hoist.

A section of the Horace Harding Expressway being built near the Flushing River in New York City is prepared for sand drains by a Caterpillar D8 diesel tractor. Tully & Di Napoli, Inc., Corona, N. Y., are making ready for about 1,250 sand drains that will stabilize this area.



Blaw-Knox MultiFoote Paver with Hydraulic Controls gives you more complete mixing in a shorter Mixing Cycle

You will be sure of higher production for hour-after-hour and day-after-day when you have a Blaw-Knox MultiFoote working in your spread of paving equipment. Faster skip operation gets the batch into the mixer with no loss of time. Hydraulic controls of batch transfer and discharge give immediate response in the automatic cycle. Cone-shaped drums assure you of thorough mixing in a shorter time or more complete mixing in a specified time than is possible in the cylindrical-shaped drum of ordinary mixers. Hydraulic controls for raising and lowering the A-Frame enable the paver to get under overpasses, bridges or other low overhead clearances and at the same time give you the advantages of single-cable skip control with its high speed, simple reeving and low maintenance cost.

These MultiFoote advantages combined with spreading or spotting action of the hydraulic operated bucket and simplicity of Paver design with its get-at-ability and freedom from excessive number of parts assure better day-after-day performance with lower maintenance costs. MultiFoote Pavers are available as single or double drum models in the 34E size.

All "Complete Package" Paving Equipment Job-Proved

Blaw-Knox "Complete Package" Paving equipment has become the first choice of contractors throughout the country. Contractors with a spread of Blaw-Knox equipment know that they can depend on its many tested and proved design features plus one distributor source for parts and service to keep their jobs on schedule. If you are planning to bid on concrete paving, plan to use the only line of equipment with experience—see your nearest Blaw-Knox Distributor today.

For more information on any of these units send for the following bulletins by number — MultiFoote, No. 2616; Road Forms, No. 2370; Finisher, No. 2517; Subgrader, No. 2227-R; Batch Plants, No. 2488; Spreader, No. 2485.

BLAW-KNOX

BLAW-KNOX COMPANY
Construction Equipment Division
40 Charleston Ave., Mattoon, Illinois

For more facts, use Request Card at page 18 and circle No. 352

Thew Shovel to produce front-end loader line

A complete line of rubber-tire front-end loaders, in addition to its line of power shovels and cranes, will be produced by the Thew Shovel Co., Lorain, Ohio. Called Moto-Loaders, 1¾-cubic yard models will be manufactured in limited quantities. A ½-yard model is now available.

W. H. Madden, loader sales manager for the new line of front-end loaders produced by the Thew Shovel Co.

The line will incorporate the latest developments of rubber-tire loaders—4-wheel drive, planetary axles, power shift transmission, torque converter, and simplified controls.

The new loaders will be merchandised under the direction of W. H. Madden, as loader sales manager. He will supervise a field and distributor organization which will be responsible for the introduction and distribution of these products.

New Black & Decker branch

The Black & Decker Mfg. Co., Towson, Md., has opened a new factory service and sales branch in Washington, D. C. Located at 2353 Rhode Island Ave. N. E., it will serve Washington and the adjacent areas of Maryland, Virginia, and West Virginia.

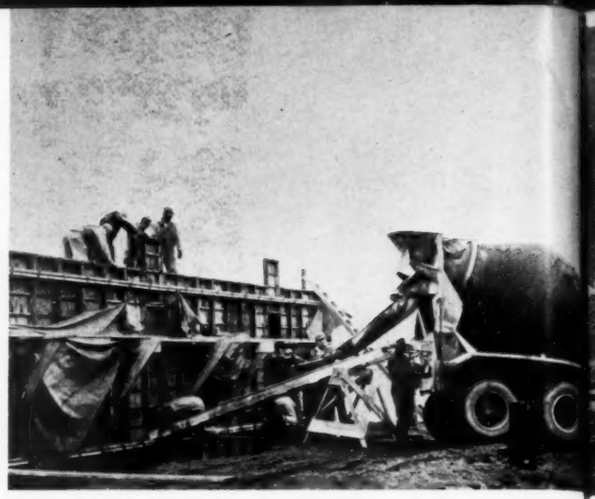
The new branch is equipped with a complete stock of replacement parts for the more than 200 different Black & Decker portable electric tools. Wm. W. Adams has been appointed branch service manager.

David White appoints

George R. Bird has been appointed district sales manager for the Dallas, Texas, office of the David White Instrument Co., Milwaukee, Wis. Bird, whose territory includes the entire Southwest, will handle surveying instruments used in the engineering and contracting fields.

Construction camera

Drilling crews sink holes to a 24-foot depth for blasting at the farmer's produce market site south of Atlanta, Ga. Chicago Pneumatic and Ingersoll-Rand compressors powered by GM 71 Detroit Diesel engines supply air. Rock removed will go into roadways and foundations for the area's twelve buildings.



Continuous pours of 50-foot sections in heights up to 18 feet are made by M. H. Wolfe & Co., Granite City, Ill., on the Granite City Steel Co.'s 10-million-gallon reservoir. After concrete is placed through pockets in the Symons form panels, the panels are replaced and the lift completed.

IT'S NEW!

. . . and made to order for Kentucky State Highway Department

CEMCO

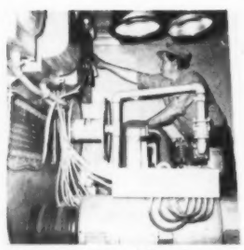
MOBILE WORK SHOP

for contractors, highway and bridge maintenance, etc.

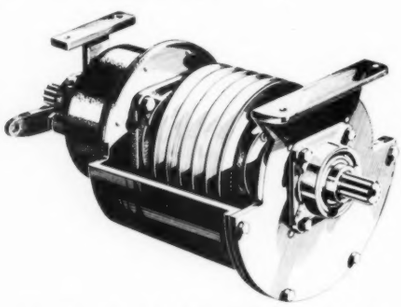
Equipped with 5 ton crane, 125 cubic feet air compressor, 15 KV generator — 300 ampere, 40 V. welder, this CEMCO Mobile Work Shop makes available a fast moving repair and construction unit to contractors, bridge maintenance crews and others.

Mounted on a chassis of owner's choice, this CEMCO Shop, sister unit to the internationally known CEMCO Mobile Machine Shop, speeds on-the-job construction and repair. Job-to-job at highway speeds greatly extends usefulness and savings.

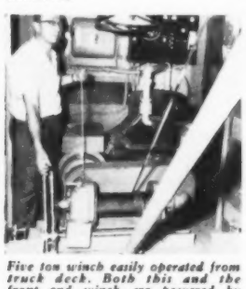
Roadside welding demonstrated here. Built-in compartment holds cable reels. Five additional compartments for other equipment, tools, supplies, etc. (Generator-welder can be run from outside power if available.)



Operator regulates delivered amperage of generator-welder which is driven by CEMCO Split-shaft Power Takeoff. Same PTO drives Jaeger—125 cubic feet at 100 P.S.I.—air compressor. Note floodlights for emergency and "round the clock" operation.



CEMCO's own Split-shaft PTO drives the combination generator-welder and the air compressor. Is available as separate unit for driving any truck-mounted equipment. Delivers full HP of any truck motor and turns in same direction as motor and at same speed.



Five ton winch easily operated from truck deck. Both this and the front end winch are powered by transmission PTO's. Note air compressor, hose reel, electrical control panel (right rear).

Boom can be dismantled and stored in special shelving when truck is in transit. Takes two men about twenty minutes to erect or dismantle boom. Special feature is two position sheave block mounted at rear of truck deck.

CEMCO

INDUSTRIES, INC.

GALION, OHIO

MANUFACTURERS OF: CEMCO—TRAILER JOCKEYS, FIFTH WHEEL CRANES, SPLIT-SHAFT PTO, DOCK RAMPS, PORTABLE LUBRICATING UNITS, BULK MATERIAL CARRIERS

For more facts, use Request Card at page 18 and circle No. 353

I-H names general manager of Construction Division

Clarence A. Hubert, former manager of engineering of the Farm Tractor Division, has been made general manager of the International Harvester Construction Equipment Division.

With I-H since 1937, he was first engine designer at the Tractor Works, Chicago, Ill., then engineer in charge of chassis design for farm and crawler-type tractors. He was made chief engineer of the Farm Tractor Division when it was formed in 1944. A year later he became assistant manager of engineering for the division, and in 1946, manager of engineering for the division.

Warren H. Thompson has been named general supervisor of the sales development section of the Construction Equipment Division. Thompson, formerly assistant general supervisor of the division, also served as a sales consultant in the department.

Harry O. Bercher, executive vice president, has been elected a director, succeeding James F. Oates, Jr., who resigned. Bercher has been assistant to the vice president of the firm's Steel Division, and general manager of that division. He was also a director of Purchasing and Traffic, and vice president of the Steel Division, Purchasing and Traffic.

Metalweld appoints two

James R. List and William L. Redditt, Jr., have been appointed sales engineers by Metalweld, Inc., Philadelphia, Pa. List will handle industrial accounts in Philadelphia, and Mercer, Ocean, and Burlington counties in New Jersey. Redditt will service contractor accounts in the Pennsylvania counties of Berks, Bucks, Lehigh, and Northampton.

P&H names sales manager

B. W. Thorpe has been promoted to sales manager of the Power Crane & Shovel Division, Harnischfeger Corp., Milwaukee, Wis. Thorpe is succeeded in his former post of district manager of the firm's Florida territory by J. E. Laffey. Laffey has been excavator salesman in P&H's Boston office.

Giant wood girders, 100 feet long, are placed on a river barge by a Marion crane to be floated to the 1,500-foot-long bridge across the Columbia River at the Priest Rapids Dam site in Washington. Timber Structures, Inc., supplied the members for the bridge, which will be used while the dam is under construction.

The next-to-cleanup job on a new 1.2-mile section of expressway through the heart of Winston-Salem, N. C., is handled by a Clipper ConSawMatic with abrasive blade. Wright Contracting Co., Columbus, Ga., uses the saw to form the transverse joints by cutting out the cardboard fillers placed during the paving.

Electric hammer firm consolidates operations

Darco Industries, Inc., El Segundo, Calif., and Demo-Haines Tool Corp., Enid, Okla., have consolidated their construction and mining products. Demo-Haines produces chiefly an electric rotary hammer that cuts through reinforced concrete and masonry; Darco designs and makes aircraft parts and equipment.

Now, Darco will do all of Demo-Haines' manufacturing. Engineering, research, and design will be continued by Demo-Haines, which has moved to Darco's main plant in El Segundo. Demo-Haines has appointed Sol Singer, 112 E. 11th St., Los Angeles, a distributor for 11 Western states.

Thew Shovel news

Wade E. Shurtleff has joined the Thew Shovel Co., Lorain, Ohio, as director of industrial relations. Shurtleff, prior to joining Thew, held the same position at Standard Products Co.

Katolight Portable POWER PLANTS

With instant, dependable electrical power on the job, work speeds up . . . costs go down. Katolight Portable Plants give your crews "plug-in" electricity anywhere, whenever they want it . . . power to operate all types of electrical tools or for steady bright flood lighting. Sizes and models for every portable, standby or continuous use from 350 watts to 75 KW. Up to 500 KVA on request.

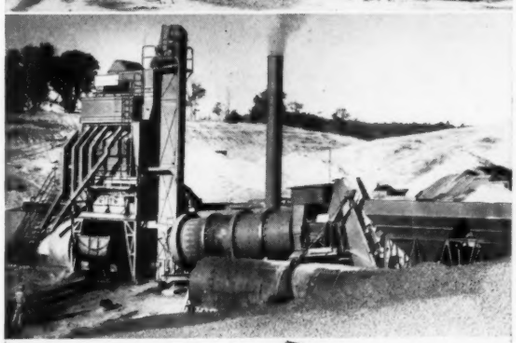
WRITE FOR NEW FOLDER ON NEW LIGHTWEIGHT PORTABLE POWER PLANTS TODAY!

KATOLIGHT CORPORATION
BOX 891-B MANKATO, MINNESOTA
For more facts, circle No. 354

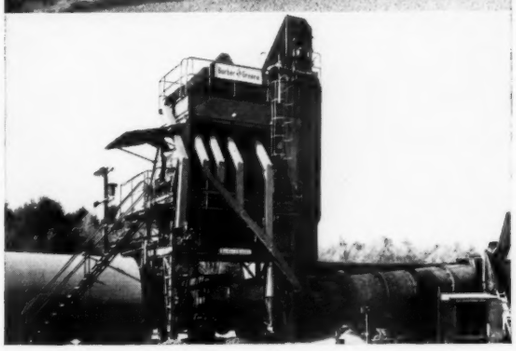
Why this paving contractor bought his 4th BatchOmatic . . .

PLANT NO. 1 — AUG. '55

PLANT NO. 2 — MAY '56



PLANT NO. 3 — SEPT. '56



PLANT NO. 4

Bayer and Mingolla had been in the asphalt paving business for many years before introduction of the BatchOmatic. During these years they had vast experience with many different makes of batch-plants, and they are thus ideally suited to judge the merits of the various plants available.

Record production. Bayer and Mingolla's first BatchOmatic is a 4000-lb. Model 894. It had turned out 145,000 tons (including 20,000 tons for the Mass. Turnpike) by October, 1956. Plant No. 3 with a 2000-lb. rated capacity has consistently produced as much as 84 tons per hour.

Record ease of erection. Although set up by a crew completely inexperienced with the BatchOmatic, Plant No. 1 was ready to produce just three days after erection started.

Record low repair costs. The second Model 894 BatchOmatic has produced more than 102,800 tons for turnpike and state work. Total repair costs for this tonnage amounted to $200 or just 2/10ths of a cent per ton of mix produced. After producing more than 145,000 tons, Plant No. 1 is still using the original paddles and pugmill liners.

Exclusive features include:

Simultaneous weighing of all sizes of aggregate . . . eliminates the human element in achieving accuracy and maximum capacity.

Instant change-over from automatic to manual operation . . . provides mixes for the drive-in trade . . . instantly reset to preset repetitive cycle operation.

New Dyna-Mix pugmill . . . gives thorough coating in less time than any other pugmill.

Instant, positive inspection of aggregate gradation and weight.

Plant No. 4, a Model 894, has just been shipped and will probably be in operation before this ad appears.

Literature on request.

Barber-Greene BG
AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT
For more facts, use Request Card at page 18 and circle No. 355

labor review

Pittsburgh area contractors are promised **a strike-free year** as far as jurisdictional walkouts are concerned under an agreement reached with the city's Building Trades Council. In exchange, the employers stipulate that they and their subcontractors will abide by the collective bargaining contracts negotiated separately by each craft.

Under the pact, the unions pledge not to strike over work assignment disputes and to abide by National Joint Board decisions. The agreement will be policed by a special committee being set up now by the Building Trades Council.

An official of the Master Builders Association of Western Pennsylvania is enthusiastic about the pact. Terming it a "hopeful step forward," he says it is the intention of both sides that the agreement provide the basis for establishing a joint grievance committee.

All 22 craft unions in Pittsburgh are members of the Council, and all but one are operating under current contracts. Plumbers are the exception, and they are on strike for a 50-cent hike in wages and fringes.

* * *

Concurrent with the attention being given by Congress to bills aimed at protection of **employee health and welfare plans**, the National Association of Insurance Commissioners says it is mapping a code of ethics to govern the underwriting of insured welfare and pension funds. If adopted, the code will cover both union and joint union-management plans.

A final draft of the code is expected to be drawn up at the Association's winter meeting next December. The Association's membership is made up of state insurance commissioners.

Notice of the proposed code also has been sent to such organizations as the National Association of Insurance Agents, National Association of Insurance Brokers, National Association of Mutual Insurance Agents, International Association of Accident and Health Underwriters, National Association of Casualty and Surety Agents, Blue Cross Commission, and Blue Shield Medical Care Plans, Inc., asking for suggestions.

Announcement of the proposed code is made by Joseph A. Navarre, Michigan Insurance commissioner and chairman of the Association's committee studying welfare fund practices. He says in most cases insurance companies and fund trustees have "scrupulously respected their responsibilities in handling union welfare programs," but that there have been instances otherwise.

Navarre sees greater need for a code because of the rapid growth of welfare and pension funds. Last year the Association anticipated current Congressional interest by adopting a recommendation on state legislation requiring registration and disclosure of details of union-management welfare funds.

If the proposed code is adopted, Navarre says, it will be fitted into the state regulatory system for insurance.

* * *

An Advisory Committee on Industrial Code Rule 23, the regulation which **safeguards workers in the construction industry**, has been appointed by the New York State Department of Labor. The committee, established to undertake a complete review of the Code Rule, held its first series of meetings recently.

The State Board of Standards and Appeals, which promulgates the Code Rules, has completed a series of statewide public hearings on proposed amendments to Code Rule No. 23 which would extend coverage to workers engaged in land-clearing, earthmoving, building of highways and dams, trenching for sewers and pipe lines, and other heavy construction work.

Prior to scheduling its public hearings, the Board had conducted its own study and made a Finding of Fact which pointed up the need for application of the Code Rule beyond the areas of construction, repair and demolition of, and excavation for, buildings and structures.

* * *

The Eight-Hour Law doesn't apply to construction contracts let by local school districts under the "impacted areas" title of the School Survey and Construction Act of 1950, and therefore indirectly financed by federal funds.

That's the new order issued by the Housing and Home Finance Agency's Community Facilities Administration to its regional administrators.

The order, which changes a situation where the administrators did require compliance with the Eight-Hour Law, follows hearings by Representative Barden's (Dem., N. C.) Labor Committee, on administration of the 1950 statute. At the hearings, both Stuart Rothman, Solicitor of the Labor Department, and Parke Banta, General Counsel of the Department of Health, Education, and Welfare, testified that they didn't know the Eight-Hour Law was being applied to construction under the 1950 statute and that they hadn't told the Community Facilities Ad-

Amazing Telephone Needs Only the VOICE for POWER!

Talk up to 30 miles—speed communications on your construction projects

Amazing, but true! Your voice generates all the power needed to operate USI Sound Powered Telephones. No batteries to wear out or create static. No worries about power failure. No maintenance required.

Speech is transmitted perfectly, clearly, over distances up to 30 miles.

These amazing phones can be put to work in hundreds of ways on construction projects. They're weather-proof, static-proof. They provide quick crew-to-crew communication. They can be used to direct crane operators—or other workers—when shouting or signaling could lead to errors and accidents.

You'll find many uses for USI Sound Powered Telephones . . . either out on the job with portable units, or in permanent (up to 16 station) systems. And you'll find the low cost of these telephones as amazing as the way they operate!

Write, wire, call, or send the coupon today for information on how USI Sound Powered Equipment can work for you. No obligation of course.

USI CORP.

UNITED STATES INSTRUMENT CORP.
Post Office Box 338—Telephone Charlottesville 3-5153
CHARLOTTESVILLE, VIRGINIA
"The Pioneer in Sound Powered Telephones . . . Since 1937"

Please send more facts on how USI Sound Powered Telephones work and how they're used—plus illustrated catalog of accessories and systems.

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ADDRESS_____

CITY_____ STATE_____

For more facts, use coupon or circle No. 356

The Times

FULCO MATS CURE CONCRETE IN 3 DAYS

• Now you can cut concrete curing time a full week by the use of Fulco Mats. The old wet-burlap-wet-earth method, which took a full 10 days, can be discarded as unsatisfactory and uneconomical.

• Fulco Mats use less water and stay wetter longer. They increase the compressive strength of concrete . . . insulate it against sudden temperature changes . . . produce a more uniform job.

• Fulco Mats can be easily reused up to 75 times. This cuts cost-per-job to the lowest figure, makes Fulco® Mats pay for themselves.

FULTEX®
Triple-Strength Tarps
Give extra protection to your men and materials

Fulton
BAG & COTTON MILLS

For information, contact your equipment dealer or nearest Fulton branch

ATLANTA • CHICAGO • DALLAS • DENVER • KANSAS CITY
MINNEAPOLIS • NEW ORLEANS • NEW YORK • OKLAHOMA CITY • PHOENIX • ST. LOUIS • SAN FRANCISCO • SAVANNAH

For more facts, circle No. 357

ministration to require compliance in the federally financed school work.

* * *

The AFL-CIO Building & Construction Trades Department in its May Bulletin uses New York State as an example of **how to push for a state safety code.**

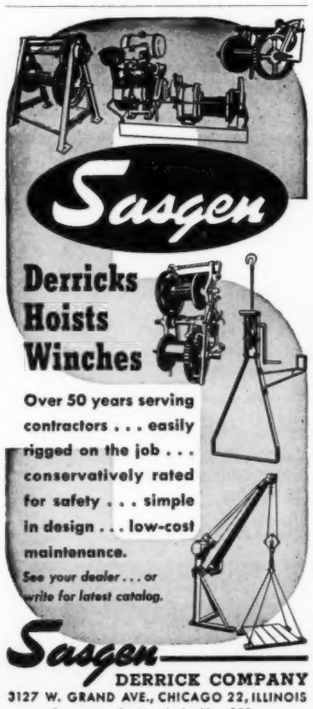
The drive toward a safety code for the state began at the Governor's Worker Safety Conference last September in New York, when the group found they lacked statistics on safety in the state and laid plans for "a definitive study of construction hazards and accidents." The study found injuries per thousand workers running at 69, compared with the national average of 59. A conference to review the study and "kick off a construction safety compaign" in the state was scheduled for the end of May.

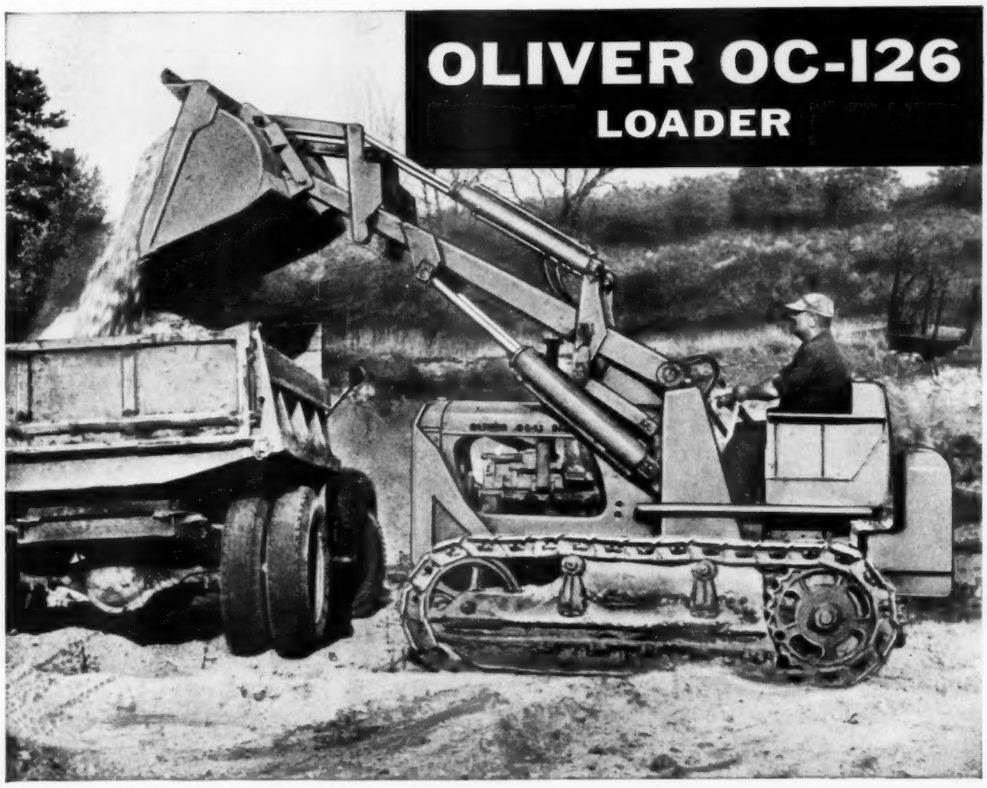
The Department predicts any construction safety program which is set up "will follow the new technique which New York is following in other industries. This technique calls for the inclusion of all methods of accident prevention, rather than law enforcement only. Labor Department field representatives will act as safety consultants and not merely as law enforcers. They will analyze and appraise safety programs. They will prepare and transmit to management their recommendations for the elimination of hazards. Their recommendations will relate not only to gloves and goggles, scaffolding, helmets, and other protective measures, but also to the safety training of employees.

* * *

Contract construction workers **earned more a week,** on the average, in March of this year than in March, 1956, but were under earnings of February of this year, the Bureau of Labor Statistics reports. The rise over last year was due both to a longer work week and higher hourly wages.

When F. H. McGraw & Co., engineers and constructors of Hartford, Conn., initiated a company-wide pension plan recently, first to sign up was Clifford S. Strike, president and oldest employee in point of service. The McGraw company plan covers all non-manual employees, some as far away as Korea, and is effective at age 65 with options at 55. Looking on is fellow "constructioneer" Frank McClean, vice president, who worked out details of the plan.


Sasgen
Derricks
Hoists
Winches
Over 50 years serving contractors . . . easily rigged on the job . . . conservatively rated for safety . . . simple in design . . . low-cost maintenance.
See your dealer . . . or write for latest catalog.
Sasgen DERRICK COMPANY
3127 W. GRAND AVE., CHICAGO 22, ILLINOIS
For more facts, circle No. 358



We gave it extra low profile for extra fast loading!

Only tractor in its class with POWER-TURN! Both the Oliver OC-126 loader and OC-12 dozer models have exclusive Oliver POWER-TURN steering. You get crawler performance far above its size and price class with this advanced steering feature. Two separate, yet connected systems of control permit sharp or gradual turns—with power *always* on both tracks. Never any traction loss or power letup.

It's a big-production machine—this new 1½-yd. OC-126 loader. "Unitized" design has loader perfectly matched to the full capabilities of the crawler.

Note the low-silhouette mounting of the loader—with the side pedestals well below the operator's eye level for work-speeding unobstructed front, side and downward vision. This better, full-view visibility alone gives higher production.

Further boosting your loading speed is the low center of gravity of the Oliver OC-126. Solid down-to-earth stability gives you faster, fuller, sure-footed loading...*fastest-yet loading cycle!* Lowest costs for sure!

For high-speed, big volume loading...the ability to push big and small jobs, nothing can match the OC-126 for best-buy value. 61 h.p. engine, gas or diesel. See for yourself at your Oliver distributor's.

OLIVER **THE OLIVER CORPORATION**
400 West Madison Street, Chicago 6, Illinois
a complete line of industrial wheel and crawler tractors and matched allied equipment

For more facts, use Request Card at page 18 and circle No. 359

The lighter side

A favorite cliche of the sportswriters "a good big man is always better than a good little man" is not necessarily so. Not in the case of Eugene David, a 42-year-old welder who is but 40 inches tall and weighs 60 pounds. The small man, a father of five incidentally, was recently flown from his home in Georgia to Shippingsport, Pa. where the Dravo Corp. of Pittsburgh is installing the nuclear portion of an atomic-electric power plant. Someone had to repair a faulty weld 10 feet inside a 15-inch pipe, and on the way in pass through a 13-inch valve. To break open the weld from the outside would have been both complicated and costly because of the limited working area. So little David wriggled through the pipe, ground out the rough area, and filled it with new weld. A subsequent X-ray indicated a perfect job.

Man in white, Eugene David, enters 15-inch pipe to repair damaged weld.

• • •

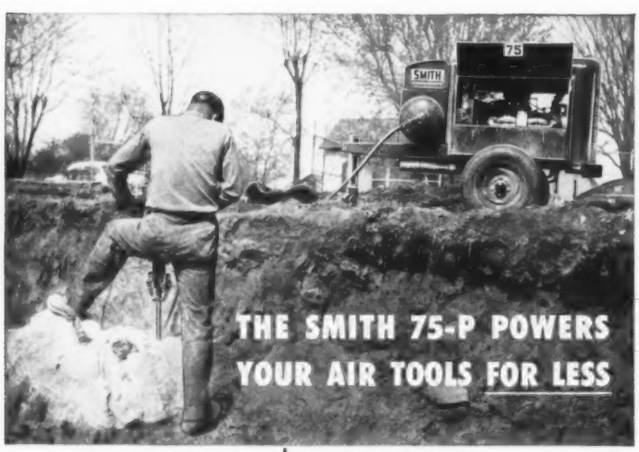
Air-placed concrete has entered a new field—sculpture. Some artists got a gunning rig from Air Placement Equipment Co., Kansas City, Mo., and sprayed a mix of sand, cement, asbestos and water over a reinforced steel frame. They say the method offers fine possibilities for outdoor sculpture, and is far quicker than hand troweling concrete or pouring it into a mold.

▲ While one artist adds asbestos to the sand-cement mix, another adjusts the Air Placement rig. A third mixes the dry materials with water as he sprays the concrete. Don't ask what this abstract sculpture will be used for.

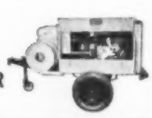
• • •

Another unusual application of pneumatic concrete occurred in Tulsa last month as part of Oklahoma's semi-centennial celebration. True Gun-All Equipment Corp. of Tulsa gunned an underground 20×10×7½-foot reinforced concrete vault with 8-inch walls to house a "time capsule" and a 1957 Plymouth car. Among other items, the capsule contains estimates, made by Tulsa residents, of that city's population 50 years from now. So when the vault is opened in 2007, to celebrate Oklahoma's centennial, the person, or his heir, with the closest estimate will receive the contents of the vault, including an unused 50-year-old automobile.

Will it run in 2007? This 1957 car was interred in Tulsa last month in a vault of gunned concrete. It will be dug up and given as a prize when Oklahoma celebrates its centennial 50 years hence. ▼



SMITH 120-P COMPRESSOR



SMITH COMPRESSORS ARE IN USE THE WORLD OVER

SMITH 45-P COMPRESSOR

Ask any Smith Compressor owner about economy! He'll tell you how the Smith 75-P replaces big compressors on scores of jobs—*adds to job profits!* The 75-P operates one heavy-duty paving breaker—two medium-duty paving breakers—or one 45-lb. rock drill. Nearly all engine and compressor parts are instantly available at reasonable cost from your Dodge Truck dealer. The 75-P is powered by a Chrysler Industrial Engine, using 3 cylinders for power, 3 for compression. Designed for high compression with large valve area, smooth carburetion. Super-finished bearings and pistons; water-jacketed discharge area. *Send coupon for free literature.*

WRITE FOR FREE LITERATURE

GORDON SMITH & CO., Inc.
483 College St., Bowling Green, Kentucky
Rush free literature on the Smith 75-P ☐ 120-P ☐ 45-P ☐ (Check one or all.)

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____

For more facts, use coupon, or Request Card at page 18 and circle No. 360

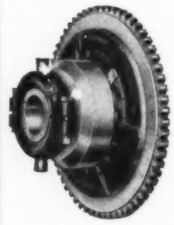
spectacular

PERFORMANCE and ECONOMY
in POWER TRANSMISSION

Conway

"the Clutch of Robust Refinement"

A "MUST" FOR ROAD-BUILDING EQUIPMENT



Every road-mile calls for intense concentration of effort to insure the success of the world's greatest road-building program. Equipment . . . cost of operation and maintenance . . . elimination of breakdowns . . . every factor depends on the measure of efficiency you demand.

CONWAY CLUTCHES are your protection wherever power must be transmitted. Let them do their share in keeping your power costs down . . . efficiency up. A vast range of sizes . . . up to 300 hp.

WRITE FOR CLUTCH DATA BULLETINS

THE Conway CLUTCH COMPANY
"the Clutch of Robust Refinement"
1109 Marshall St. Cincinnati 25, Ohio

For more facts, use Request Card at page 18 and circle No. 361

Product LITERATURE

For further information on any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Chain hoists

A booklet describing the Cyclone Model M heavy-duty high-speed chain hoist is offered by the Chisholm-Moore Div. of Columbus McKinnon Chain Corp.

The literature presents several types of the Model M, with capacities ranging from ¼ to 10 tons.

Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Dept. C&E, 6067 Fremont Ave., Tonowanda, N. Y.

Circle No. 68.

Grading line

A 32-page bulletin on its complete line of road machinery is offered by the Huber-Warco Co. Bulletin No. HWC 541 describes in detail each of Huber-Warco's motor graders, tandem rollers, three-wheel rollers, and the maintainer.

Huber-Warco Co., Dept. C&E, 202 N. Greenwood St., Marion, Ohio.

Circle No. 15.

Asphalts, emulsions

A new booklet has been issued by the American Bitumuls & Asphalt Co. describing its nationwide production and distribution facilities for all types of paving asphalts and emulsions, plus various types of emulsified asphalts for the construction industry. These include American Bitumuls emulsified asphalts, paving asphalts, liquid asphalts, industrial asphalts, and Laykold asphalt specialty products.

American Bitumuls & Asphalt Co., Dept. C&E, 200 Bush St., San Francisco 4, Calif.

Circle No. 9.

Truck mixer standards

Information on the ratings recently established as standard for truck mixers and agitators is available in a booklet from the Truck Mixer Manufacturers Bureau. Approved by the Board of Directors of the National Ready Mixed Concrete Association, the revised standards became effective May 1, 1957.

The bulletin covers the new requirements for all phases of mixing.

Truck Mixer Manufacturers Bureau, Dept. C&E, Munsey Bldg., Washington 4, D. C.

Circle No. 28.

Guardrail data

Design features, engineering data, installation instructions, and specifications for USF Barrier-Beam and Universal-Beam guardrail are presented in an illustrated bulletin released by United Steel Fabricators, Inc.

Said to offer peak safety at low cost, both rails are advised for use on highways, parking lots, parks, bridges, and approaches.

United Steel Fabricators, Inc., Dept. C&E, Gasche St., Wooster, Ohio.

Circle No. 16.

To obtain any of the literature described in this section, circle the number given at the end of the item on the Request Card bound in at page 18 of this issue.

What size pump would you use?

Selecting a pump would be a major problem, if performances were not specified by AGC standards and guaranteed by Rating Plate.

With AGC standards you have a simple, completely reliable way to know the minimum performance of any rated pump under a range of service conditions. Furthermore these standards guarantee you the engine power and up-to-date design needed to assure satisfactory service life.

To maintain these helpful standards, demand the AGC Rating Plate on any pump you buy.

Demand this Rating Plate for your protection.

CONTRACTORS PUMP BUREAU

Affiliated with The Associated General Contractors of America

Munsey Building, Washington 4, D. C.

BARNES MFG. CO. Mansfield, Ohio	**ESSICK MFG. CO.** Los Angeles, Calif.	**JACUZZI BROS., INC.** Richmond, Calif.
C. H. & E. MFG. CO. Milwaukee 12, Wisc.	**PEERLESS PUMP DIVISION** Food Machinery & Chemical Corp. Los Angeles 31, California	**MARLOW PUMPS** Div. of Bell & Gossett Co. Midland Park, N. J.
CARVER PUMP CO. Muscatine, Iowa	**THE GORMAN-RUPP CO.** Mansfield, Ohio	**McGOWAN PUMP DIVISION** Leyman Mfg. Co., Cincinnati 2, Ohio
CHAIN BELT CO. Milwaukee 1, Wisc.	**THE JAEGER MACHINE CO.** Columbus, Ohio	**RICE PUMP & MACH. CO.** Belgium, Wisc.
CONSTRUCTION MCHY. CO. Waterloo, Iowa		**STERLING MACHY. CO.** Los Angeles, Calif.

WORTHINGTON CORPORATION, Contractor's Pump Division, Plainfield, N. J.

For more facts, use Request Card at page 18 and circle No. 362

Low Cost Loading

WITH NO SACRIFICE OF STRENGTH OR CAPACITY

40' x 24" belt Model 202 conveyor with 6' x 30" screen.

Rugged Box-Type Construction Permits Amazing Low Price

Here's the answer to low cost materials handling. Prices of the new Kolman Model 202 conveyor are so low you'll be amazed—yet the design and operature features are the very finest.

The rugged "box-type" construction of the Model 202 conveyor give it unusual strength and rigidity. The sides are fabricated of 3/16" steel plate formed into a channel 16" deep with 2" legs. The steel belt cover reaches completely across the top, completing the box and completely encasing the return belt to prevent materials from working in to cause belt damage.

The 202 is available with the Head Pulley Clutch feature which allows the belt to be stopped and started while the vibrating screen remains in operation.

The Kolman 202 is rugged enough to carry a loading trap and large vibrating screen without additional support. It will take the kind of punishment that is dished out to a portable outfit—and will cost you far less money to own and operate. Available in 18" and 24" belt widths, in lengths up to 50'.

Sturdy design of Model 202 permits installation of loading trap on tail section, portable without disassembly.

Single-deck vibrating screen folds into towing position without dismounting screen or any of drive assembly.

SEND for FREE literature

KOLMAN Manufacturing Co.

4922 West 12th St. Sioux Falls, S. D.
Please send literature on —

☐ Model 202 conveyor
☐ Model 101 Heavy Duty Conveyor
☐ Vibrating Screens ☐ Feeders ☐ Traps

Quote ..... size or ..... capacity

Name .....

Address .....

City .....

For more facts, use coupon, or Request Card at page 18 and circle No. 363

Dewatering service

A new catalog issued by the American Dewatering Corp. describes the advantage of contract predraining of excavations, a field in which this concern is a leading specialist. The catalog is illustrated with photographs of dewatering jobs of various types.

American Dewatering Corp., Dept. C&E, 140 Cedar St., New York 6, N. Y.

Circle No. 17.

Portable electric plants

Portable electric plants of all sizes are described in a folder offered by the Universal Motor Co. The various models featured are available with air and water cooling systems, and may be operated on gasoline, natural or bottled gas, fuel oil, or diesel fuel. Power generation ranges to 35 kw.

Universal Motor Co., Dept. C&E, 428 Universal Drive, Oshkosh, Wis.

Circle No. 2.

Trailer equipment

Literature on its truck and trailer equipment is available from the Holland Hitch Co. The various units described include fifth wheels, landing gears, pintle hooks, couplers, towing rings, towing hooks, and king pins.

Holland Hitch Co., Dept. C&E, Bouman Square, Holland, Mich.

Circle No. 104.

Backhoe-shovel-crane

A descriptive sheet on its Samson convertible digger is available from Avery Tractor, Inc. According to the literature, the machine is completely hydraulic and requires one man only for all operations. It has a digging depth of 11 feet, shovel loading clearance of 12 feet, and a lifting height of 18 feet with a 1-ton capacity.

Avery Tractor, Inc., Dept. C&E, Route 20, W. Lebanon, N. Y.

Circle No. 93.

Report on slag aggregate

A special 23-page report on "Degradation of Aggregates in Bituminous Concrete As Measured by Laboratory and Field Compaction" can be obtained from the National Slag Association. The report carries results of special field and laboratory studies to determine extent of degradation of slag aggregate in comparison to natural aggregates of good quality. The report also includes results of other similar investigations as supplementary information.

National Slag Association, Dept. C&E, 613 Perpetual Bldg., Washington 4, D. C.

Circle No. 39.

Diesel compressors

Integrally-built diesel-engine compressors for use in large construction projects are shown in a new bulletin, Form 3207, released by Ingersoll-Rand.

The unit featured in this new booklet combines a 4-cycle V-angle heavy-duty diesel engine and the slow-speed horizontal compressor on a single crankshaft, without the use of gears or other coupling mechanism.

Ingersoll-Rand, Dept. C&E, 11 Broadway, New York 4, N. Y.

Circle No. 13.

Belt conveyor idlers

The firm's complete line of belt conveyor idlers, including troughing, flat, self-aligning, and return designs, is described in Bulletin 119 from the C. O. Bartlett & Snow Co. Rolls of 4, 5, and 6-inch diameter, available with either Timken or "Sealed for Life" bearings, are described and illustrated.

C. O. Bartlett & Snow Co., Dept. C&E, 6200 Harvard Ave., Cleveland 5, Ohio.

Circle No. 29.

Wire rope usages

A well illustrated bulletin, "Wire Rope Recommendations for General Contractors", has been prepared by the Hazard Wire Rope Division of American Chain & Cable Co. Describing the manufacturer's complete line of Lay Set pre-formed wire rope, wire rope accessories, and Dualoc boom cable assemblies, the bulletin contains data on construction features, applications, diameters, and other aspects of interest to engineers and contractors.

Hazard Wire Rope Div., American Chain & Cable Co., Inc., Dept. C&E, 271 S. Penn Ave., Wilkes-Barre, Pa.

Circle No. 14.

Diamond blade selector

A new pocket guide for the selection of the proper diamond blade for cutting concrete and masonry materials is available free of charge from the

because of the

HANCOCK'S ELEVATOR

No other Scraper can move so much dirt, so fast!

Because the Hancock Scraper elevates material instead of force loading it, you get high speed loading and move more dirt with less horsepower.

The Hancock Elevating Scraper has the features to give you lowest-cost-per-yard of earth moved. With the elevator continually removing the dirt from around the cutting blade and distributing it evenly throughout the scraper, you get a balanced load at all times. The Hancock 11 Yard Elevating Scraper is hydraulically controlled, works efficiently with any troctor of 60 horsepower or over, and turns in only 28 feet.

HANCOCK MANUFACTURING CO

PO3-8297 Lubbock, Texas

Patents Pending

HANCOCK

These HANCOCK features mean of earth moved.

FIFTH WHEEL — Extreme flexibility and simple adjustment result from ball joint "pie fifth-wheel.

WHEELS — Scraper has heavy-duty wheels, standard industrial tires and standard wheel bearings.

SPREADING UNIT—Delayed dumping of the front bucket permits controlled release and spreading of dirt.

GEARBOX and ELEVATOR —Heavy duty elevator frame is combined with a strong, rugged, trouble-free gear box.

REAR AXLE — Simple but rugged rear axle construction provides for easy alignment to assure level cut.

For more facts, use Request Card at page 18 and circle No. 364

Consolidated Diamond Tool Corp.

Easy to use, the selector makes possible a visual method of choosing a diamond blade according to its efficiency range.

The new blade selector is for use not only in selecting the proper blade for the material to be cut, but to see readily the relative efficiency of the blade selected.

Consolidated Diamond Tool Corp., Dept. C&E, 320 Yonkers Ave., Yonkers 2, N. Y.

Circle No. 35.

To obtain any of the literature described in this section, circle the number given at the end of the particular item on the handy Request Card that is bound in at page 18 of this issue.

Bituminous mixer

A folder describing its Model 700 Trail-O-Patcher is offered by Littleford Bros., Inc.

The many Patcher features listed in the literature include twin pugmills for drying and mixing the aggregate, and a 7-cubic foot heat-insulated aggregate compartment. The Model 700, it is stated, is designed to economically produce hot or cold bituminous mixes.

Littleford Bros., Inc., Dept. C&E, 457 E. Pearl St., Cincinnati 2, Ohio.

Circle No. 58.

Power steering

A 12-page engineering and service manual for its hydraulic power steering gear is offered by the Ross Gear & Tool Co. The booklet contains information on the gear's operation, and a comprehensive coverage of its installation and subsequent maintenance.

Ross Gear & Tool Co., Inc., Dept. C&E, 714 Heath St., Lafayette, Ind.

Circle No. 97.

Concrete-cutting saws

Information on its line of concrete-cutting saws and saw blades is available in an illustrated price sheet from Eveready Briksaw Co. Among the units featured in the folder is the wet or dry cutting Model DW, with a patented device that automatically adjusts blade pressure to any hardness of material.

Eveready Briksaw Co., Dept. C&E, 1509 S. Michigan Blvd., Chicago 5, Ill.

Circle No. 3.

Aggregate dryer

A folder on its Model 25T Trail-O-Dryer and Model 5T25 dual feeder bin combination is available from Littleford Bros., Inc. The Trail-O-Dryer is a unit designed to heat and dry sand and aggregate for bituminous mixes.

Littleford Bros., Inc., Dept. C&E, 485 E. Pearl St., Cincinnati 2, Ohio.

Circle No. 126.

For more facts, circle No. 365→

Hydraulic hoist

The Tusky hoist, an all-steel hydraulic platform hoist which elevates building materials to a height of 100 feet at a speed of one minute, is described and illustrated in a folder from Tubular Structures Corporation of America.

Easily transported and erected or taken down by one man in 2½ minutes, the Tusky hoist operates automatically and requires a minimum of maintenance, according to the literature.

Tubular Structures Corporation of America, Dept. C&E, 2960 Marsh Street, Los Angeles 39, Calif.

Circle No. 163.

Rotary masonry drills

A folder describing the performance of the company's products is available from Termite Drills, Inc. Rotary masonry drills of various types are described and illustrated. The booklet features tables covering specifications, prices, and drilling recommendations.

Termite Drills, Inc., Dept. C&E, P. O. Box 5546, Pasadena, Calif.

Circle No. 150.

Waffle-type forms

Metal domes for the economical forming of waffle-type concrete joist construction are described in a folder from Ceco Steel Products Corp.

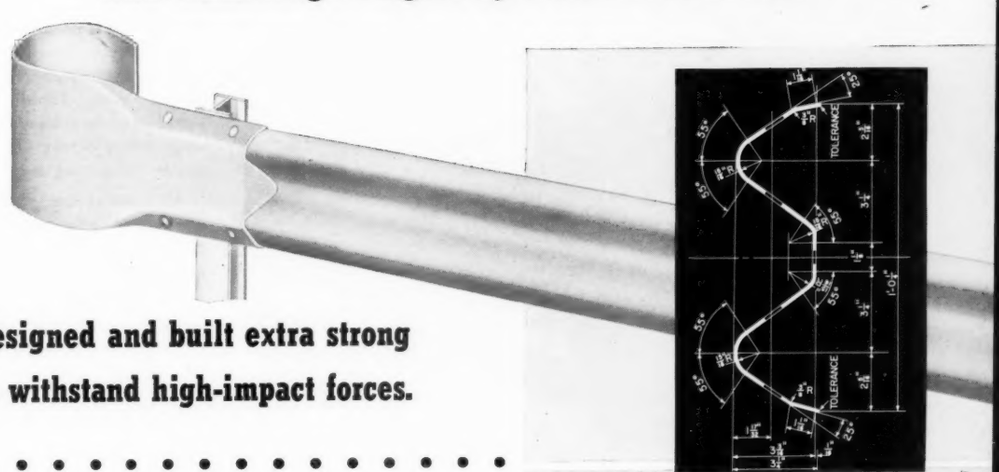
Steeldomes are removable one-piece domes developed especially for exposed ceiling construction. The folder furnishes information on Steeldome sizes and corresponding concrete quantities, and is illustrated with photographs and drawings.

Ceco Steel Products Corp., Dept. C&E, 5601 W. 26th St., Chicago 50, Ill.

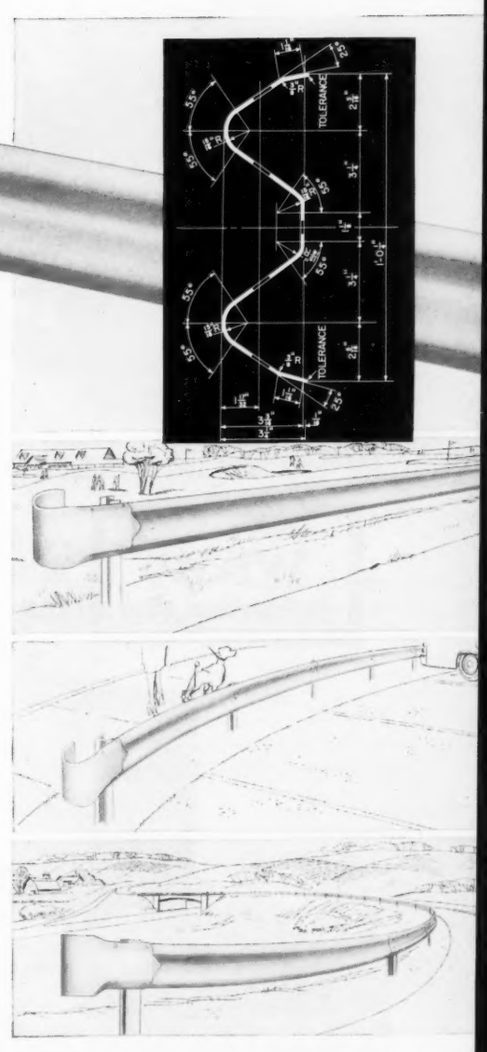
Circle No. 30.

Another Important Highway Product by AMERICAN BRIDGE

USS AmBridge Highway Beam Guard Rail



Designed and built extra strong to withstand high-impact forces.



Possessing all the design features of the modern universal guard rail section that has been adopted by the majority of State Highway Departments, the new USS AmBridge Highway Beam Guard Rail offers the following extra advantages that make it the finest traffic safeguard available today.

1. All mill scale is removed from the steel before the guard rail section is formed, assuring uniform tenacious paint adherence. *This is a standard specification.*
2. Prior to painting, all sections are degreased, given two hot-water rinses, and oven-dried. Then a coat of rust-inhibiting primer is applied.
3. Specifications include standard ⅝" *high-strength* bolts that conform to ASTM A325.

With its combination of these and other such desirable characteristics as rugged strength, ease and speed of installation, controlled flexibility, high visibility, and negligible maintenance, you can count on unsurpassed economy, safety, and permanence of installation with USS AmBridge Highway Beam Guard Rail.

For a copy of our new descriptive folder, contact our office nearest you or write direct to our Pittsburgh headquarters.

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION · GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.
Contracting Offices: AMBRIDGE · ATLANTA · BALTIMORE · BIRMINGHAM · BOSTON · CHICAGO · CINCINNATI · CLEVELAND · DALLAS · DENVER · DETROIT · ELMIRA · GARY HOUSTON · LOS ANGELES · MEMPHIS · MINNEAPOLIS · NEW YORK · ORANGE, TEXAS · PHILADELPHIA · PITTSBURGH · PORTLAND, ORE. · ROANOKE · ST. LOUIS · SAN FRANCISCO · TRENTON
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **AMERICAN BRIDGE**

UNITED STATES STEEL

Dozer rippers

E. A. Rogers Co. offers a folder describing and illustrating four models of its dozer ripper, its Carryall ripper, and its brush rooters. Tractor sizes for the various dozer ripper models are given.

E. A. Rogers Co., Dept. C&E, Grass Valley, Calif.

Circle No. 129.

Cutting machines

A folder describing its abrasive cutting machines is obtainable from Beaver Pipe Tools, Inc. The Beaver "Speed Cut" machines are used in the cutting of cast iron, wire rope, steel pipe, brass, copper, or cement-lined pipe, and many other materials, according to the literature.

Beaver Pipe Tools, Inc., Abrasive Machine Division, Dept. C&E, Warren, Ohio.

Circle No. 143.

Portable pumps

Specification sheets on the Midland Model 7M (7,000-gph-capacity) and Model 5M (5,000-gph-capacity) portable contractors' pumps are available from Midland Products Co. Pump performance, pump specifications, and engine specifications for the two models are given and various recommended uses are listed.

Midland Products Co., Dept. C&E, 181 Greenwood Ave., Midland Park, N. J.

Circle No. 151.

Concrete planer

A descriptive sheet containing brief specifications of the Concut Bump Cutter for use in planing concrete or asphalt surfaces is available from Concut Sales, Inc. According to the literature, the machine uses a cutting head composed of a series of diamond blades and travels at a speed of 90 to 100 feet per minute to effectively plane off bumps and rough places in concrete.

Concut Sales, Inc. According to the N. Santa Anita Ave., Arcadia, Calif.

Circle No. 132.

Mortar manual

A new mortar manual has been published by the Universal Atlas Cement Co. The new publication contains complete information on mortar preparation, placing procedure, and general instructions for gun-applied linings in a variety of installations. An appendix contains information on selected aggregates, thermal conductivities of Lumnite concretes, and strength curves.

Universal Atlas Cement Co., Dept. C&E, 100 Park Ave., New York 17, N. Y.

Circle No. 12.

Tracing paper

A folder describing Phantom Grid, a specially prepared tracing paper, is available from B. K. Elliott Co. Stressed in the literature is the paper's nonreproducing grid lines. The folder includes pertinent information and a sample of the paper.

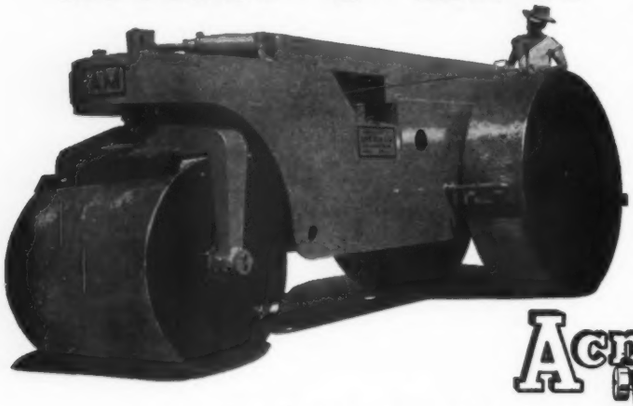
B. K. Elliott Co., Dept. C&E, 126 Sixth St., Pittsburgh 22, Pa.

Circle No. 149.

Mobile field office

A specification sheet on its line of mobile offices for contractors' use in the field is offered by Mobile Office, Inc. The sheet describes four sizes of trailer offices, available with a variety of optional features and fitted to the buyer's specifications, and illustrates

INGRAM
with NEW
REVERSE-O-MATIC



Ingram rollers with the reverse-o-matic drive permits no-stop power shifted reversing. Reverse-o-matic can be shifted while the roller is moving, therefore there is no delay for clutching or shifting gears. There is no maintenance required, no adjustments to be made and no clutches to replace. The reverse-o-matic furnishes smooth shockless power that reduces engine wear and prolongs life of other power transferring mechanism.

All these advantages show that an Ingram roller equipped with "Reverse-o-Matic" furnishes the most practical roller you can use.

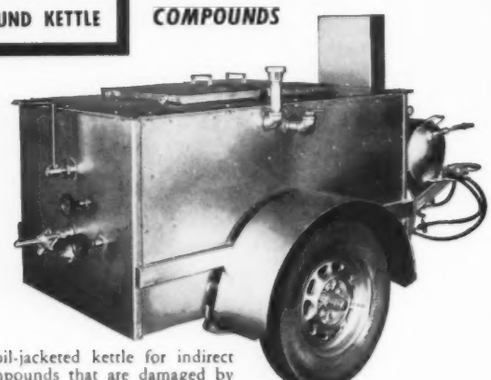
See and get the facts on Ingram before you buy your next roller.

Acme IRON WORKS
P.O. BOX 2020 • SAN ANTONIO 6, TEXAS

For more facts, use Request Card at page 18 and circle No. 366

White
F-10 COMPOUND KETTLE

. . . FOR LOWER COST MELTING OF JOINT COMPOUNDS



TOP QUALITY, oil-jacketed kettle for indirect heating of compounds that are damaged by high temperatures.

FOOLPROOF manual burner adjustment.

LOW COST of $998 f.o.b. factory, complete with two thermometers (one for heating-jacket oil, one for compound), manual agitator, oil burner, steady rest, towing eye, tires. Engine agitator or propane heating available

CAPACITY: 120 gallons of compound.

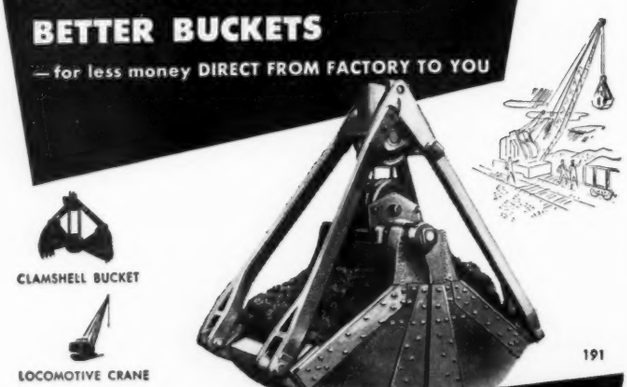
FOR LITERATURE, WRITE

OTHER PRODUCTS
Asphalt Plants, Tool Heaters, Surface Heaters, Torches and Burners

WHITE MANUFACTURING COMPANY, ELKHART 9, INDIANA

For more facts, use Request Card at page 18 and circle No. 367

BROWNHOIST BUILDS BETTER BUCKETS
—for less money DIRECT FROM FACTORY TO YOU



CLAMSHELL BUCKET
LOCOMOTIVE CRANE
COAL-ORE BRIDGE
ORE UNLOADER

191

ROPE REEVE, POWER WHEEL AND LINK TYPE

WRITE FOR ILLUSTRATED CATALOGUE
INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN

For more facts, use Request Card at page 18 and circle No. 368

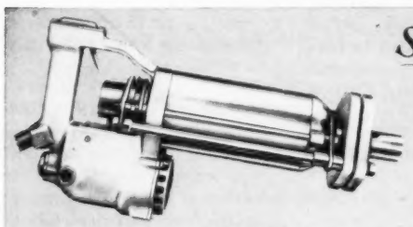
the line with exterior and interior photographs and a floor plan.

Mobile Office, Inc., Dept. C&E, 7300 Stony Island Ave., Chicago 49, Ill.

Circle No. 133.

THE BIG PLUS* IN TRANSPORT TRAILERS
*PROVED BY MILLIONS OF MILES
MODEL SP
Jack over axle models. Capacities 11 through 25 tons.
MODEL GTX
Triple axle, 6 dual wheels. Capacities 25 through 45 tons. Flat or drop deck.
MODEL TT
Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.
MODEL KS-F
Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.
MODEL GXTT
Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.
MODEL GPX
Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.
MODEL XTT
Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.
MODEL T-8-18
14 or 18 foot length between the wheel tilt trailers. 8-10 ton capacity.
MODEL GPR
Removable gooseneck. Tandem, triple or trunnion axles. Flat or drop decks, or as beam trailers.
MODEL PX
Heavy-duty tandem axle, spring mounted platform or float.
MODEL KSO-D
Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.
MODEL MSO
Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.
DUMP TRAILERS
Single or tandem axle models. Standard capacities 8 through 15 yards.
MODEL PX-O
Heavy-duty, self-loading tandem axle oil field float.
WRITE FOR FREE CATALOG OF COMPLETE LINE
"TRANSPORTATION ENGINEERING A SPECIALTY"
TRANSPORT TT INC TRAILERS
CEDAR RAPIDS IOWA, U.S.A.

For more facts, use Request Card at page 18 and circle No. 369



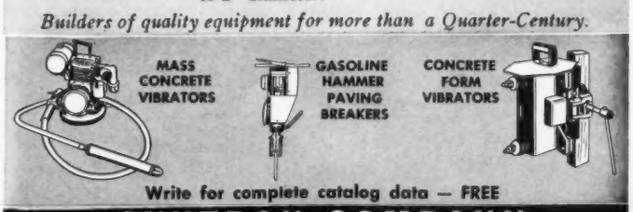
SYNTRON

ELECTRIC HAMMER DRILLS

...the only Electric Hammers available with automatic, self-rotating drill bit.

SYNTRON Electric Hammer Drills are designed for fast, easy drilling in concrete. Constructed for long, dependable service, employing the electromagnetic principle, they will maintain their efficiency day after day with a minimum of maintenance. SYNTRON'S exclusive automatic rotation of drilling bits provides ease of handling in any position. Available in sizes to meet every drilling need. Capacities from 3/8" to 2" diameter.

Builders of quality equipment for more than a Quarter-Century.



Write for complete catalog data — FREE

SYNTRON COMPANY

227 Lexington Ave. Homer City, Pa.

For more facts, use Request Card at page 18 and circle No. 370

Use the Request Card at page 18 to obtain any of this literature.

Buying a grader

"Getting the Most in Motor Graders" is a booklet recently released by Caterpillar Tractor Co. Designed to help the buyers choose a motor grader with the proper job-production ability for the most efficient results, this booklet is said to be specifically aimed at the needs of municipal, county, and township governments.

Caterpillar Tractor Co., Dept. C&E, Peoria Ill.

Circle No. 135.

Cable-dump trailer

The Fruehauf Trailer Co. has issued a data sheet on the Fruehauf-Schonrock cable-dump trailer which gives, in addition to specifications of the unit, information as to its construction and uses.

Fruehauf Trailer Co., Dept. C&E, 10928 Harper Ave., Detroit 32, Mich.

Circle No. 144.

Concrete cart

A descriptive sheet on its M-30 Prime-Mover, a unit designed for rapid delivery of concrete on bridge construction, piers, warehouses, and other long haul jobs, is available from the Prime-Mover Co.

The literature describes such features of the unit as hydraulic torque converter drive, easy steering and braking, and convenient dump action controlled from the operator's position.

The Prime-Mover Co., Dept. C&E. Muscatine, Ohio.

Circle No. 62.

Asphalt plant

The Madsen Model 391 Hot Rod asphalt plant is the subject of a folder which may be obtained from the Baldwin-Lima-Hamilton Corp.'s Madsen Works. Features of this 3,000 to 5,000-pound-capacity plant are listed, and construction and operational details are explained. Full specifications are given on the last page.

Madsen Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Dept. C&E, 14120 E. Rosecrans Ave., P. O. Box 38, La Mirada, Calif.

Circle No. 161.

Self-locking nuts

A folder listing the features of the company's self-locking nut can be obtained from the Automatic Nut Co., Inc. Its application in bolted steel construction is one of the uses stressed by the company.

The Automatic Nut Co., Inc., Dept. C&E, Lebanon, Pa.

Circle No. 141.

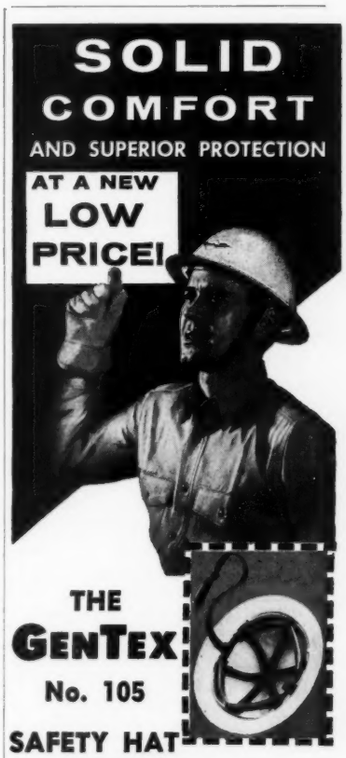
Rubber pipe joints

A booklet describing Tylox rubber gaskets for leak-proof coupling of concrete and vitrified clay sewer pipe is available from Hamilton Kent Mfg. Co.

Of special interest to those concerned with designing and constructing sewerage and drainage systems, the booklet gives the history of the development of rubber joints, and complete engineering and application data on Tylox, said to be the first successful coupling of this type.

Hamilton Kent Mfg. Co., Dept. C&E, 427 W. Grant St., Kent, Ohio.

Circle No. 123.


SOLID COMFORT
AND SUPERIOR PROTECTION
AT A NEW LOW PRICE!
THE GENTEX No. 105 SAFETY HAT
Delivers
Full-Shift COMFORT . . .
Men like to wear it because it's lightweight, with wrinkle-free adjustable head band and exclusive new better-than-ever snap-in sling.
Full-Shift PROTECTION . . .
Strong plastic construction that tops all Government safety standards, insulates against heat and sun and withstands over 10,000 volts.
You Can Bet your Life On a GENTEX
Foremost Manufacturer of Helmets for the Military
Write today for a test hat and information on our new low prices.
GENERAL TEXTILE MILLS, INC. Dept. E
450 SEVENTH AVE., NEW YORK 1, N. Y.

For more facts, circle No. 371

Six flexible conduits, each containing four strands for the prestressing, are in position. A Blaw-Knox spreader distributes concrete from the transit mixer on the Mack truck.

Prestressed concrete roadway is made ready for testing

No joints are used in 400-foot-long, 5-inch-thick experimental slab; special joints are developed for 100-foot sections at each end

An experimental prestressed concrete highway stretch that does away with seven construction joints in every 400 feet of road is currently undergoing tests in Pennsylvania that may point the way to some big changes in road design and construction.

Though prestressing is no longer a unique operation on bridges, buildings, and other structures, the technique has been tried on highway work mainly in Europe. In theory, such a highway has many advantages over a conventional concrete road; the chief problem to be overcome is that of finding a practical and economical method of prestressing the roadway slab.

That was one of the objectives of Jones & Laughlin Steel Corp., Pittsburgh, Pa., which built the 600-foot-test section on a 742-acre site near the Graham Laboratory for J&L research on Pittsburgh's Baldwin Hill. The stretch consists of a 400-foot section without joints and 100-foot prestressed sections at either end to provide two joints for testing purposes. In contrast to the 10-inch thickness of present day concrete highways, the test section has a slab 5 inches thick.

Prestressed section

In the planning stage for several years, the project actually got rolling late last year when earthmoving equipment moved onto the experimental site to bring the stretch to grade. The prestressing operations were deferred until this year.

Crews started the prestressing by anchoring 7/16 inch wire strands at opposite ends of the 400-foot section of roadway. The strands were passed through flexible steel conduits that were to be embedded in the concrete.

A 6-foot-gap was left in the middle of the 400-foot concrete section and ten 150-ton Rodgers hydraulic jacks were placed longitudinally in this space. Then concrete was poured for the roadway slab. When the concrete had set, the gap was jacked apart to a width of 8 feet—far enough to produce the required tension in the wire strands and compression in the concrete.

This done, a device specially developed to hold the sections apart was placed in the gap while the jacks were removed. Concrete was then poured into the gap.

The prestressed section has been

Excavate and load 600,000 yds. with 2 graders

J. D. & P., Inc. equips 2 "660's" with ELEGRADERS

Johnson, Drake, and Piper, Inc. faced the problem of moving 600,000 yards of dirt 3½ miles over city streets in suburban Buffalo, for a new section of New York Thruway. Contractor found the solution in hauling by truck . . . digging and loading clay material with two 150 hp Adams* 660 motor graders with outrigger Elegrader attachments.

27 trucks haul to bridge approach

Photos show J. D. & P. loading out dirt to build up a thruway bridge approach. 27 sideboarded 10-yard dump trucks each hauled 12-yard loads over city streets to the fill. Two dozers, a sheep's foot roller, and a 50-ton pneumatic roller, spread and compacted the dirt. At the borrow, a grader bladed off-highway haul roads and maintained the pit.

Trucks hauled approximately 3½ miles (one way) — including 1200' over rough construction sand at the borrow exit. Haulers' return route included a 500' entrance to borrow, over grader-maintained construction haul road of average quality.

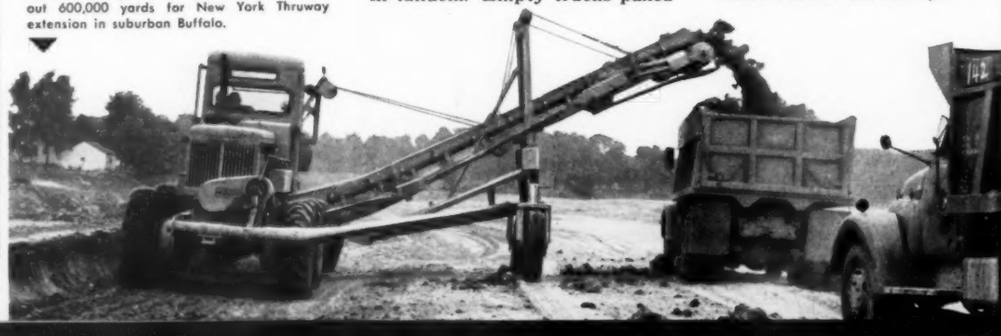
Loads from ¾ mile-long borrow

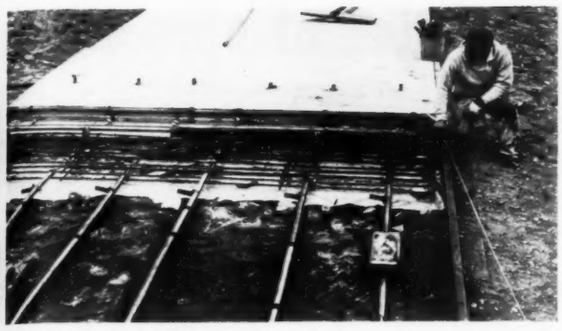
Two "660's" with Elegraders loaded trucks in a flat area, cutting against the outer perimeter of the ¾ mile-long borrow. The two loaders worked in tandem. Empty trucks pulled under the conveyor of whichev unit was available. On this strip ping operation, there was very litt truck waiting time — in fact, El graders could have kept more truck busy on the lengthy 3½ mile hau

Strips clay @ 460 yds. per hour

Elegraders and trucks worked tw 8-hour shifts daily. An extra ma was assigned to ride the front en of each of the Adams graders to ai in truck-spotting, to count load with timer, and to assure that haule got a full load, fast. Each El grader excavated and loaded at th rate of 460 loose yards of mediu density clay per hour. Stop-watc timing showed Elegrader heape trucks in as little as 40 seconds loa ing time per truck . . . plus an ave age 10 seconds for positioning haulers under the conveyor.

Adams 660 grader with outrigger Elegrader strips 18" of clay fill along perimeter of ¾ mile-long borrow. With 2 Elegraders, Johnson, Drake, and Piper, Inc. excavated and loaded-out 600,000 yards for New York Thruway extension in suburban Buffalo.





At the end of the 400-foot slab, wire strands emerge from the flexible conduit in a butterfly pattern for better anchorage in the concrete. A special joint will be used between this slab and the completed 100-foot-long section.

A 6-foot gap was left in the slab for Rodgers hydraulic jacks that applied stress to the pretensioning wires after concrete had been poured. Here, a special framing device is being assembled to hold the slabs apart so that the jacks can be removed and the gap filled.

designed to overcome the weakness of concrete in tension. Since present-day concrete roads are unable to withstand tension, transverse joints are used to allow the concrete to expand and contract.

But the area around these joints eventually deteriorates because heavy loads exert pressure on the edge of the concrete and create a "pumping" action. Seven joints—or seven places where deterioration might take place—are eliminated in every 400 feet of this type of road.

Experimental joint

Since a joint in this road will have to compensate for the expansion and contraction of 400 rather than the customary 60 feet of concrete, an experimental joint was developed for the stretch by B. F. Goodrich Industrial Products Co. in collaboration with J&L. It will soon be installed and tested as part of research on the section.

This 12-inch-wide joint extends the full depth of the concrete slab and is designed to allow the top surface to remain level during maximum expansion and contraction of the sections. The joint consists of a series of metal plates bonded to rubber to carry the vertical loads imposed.

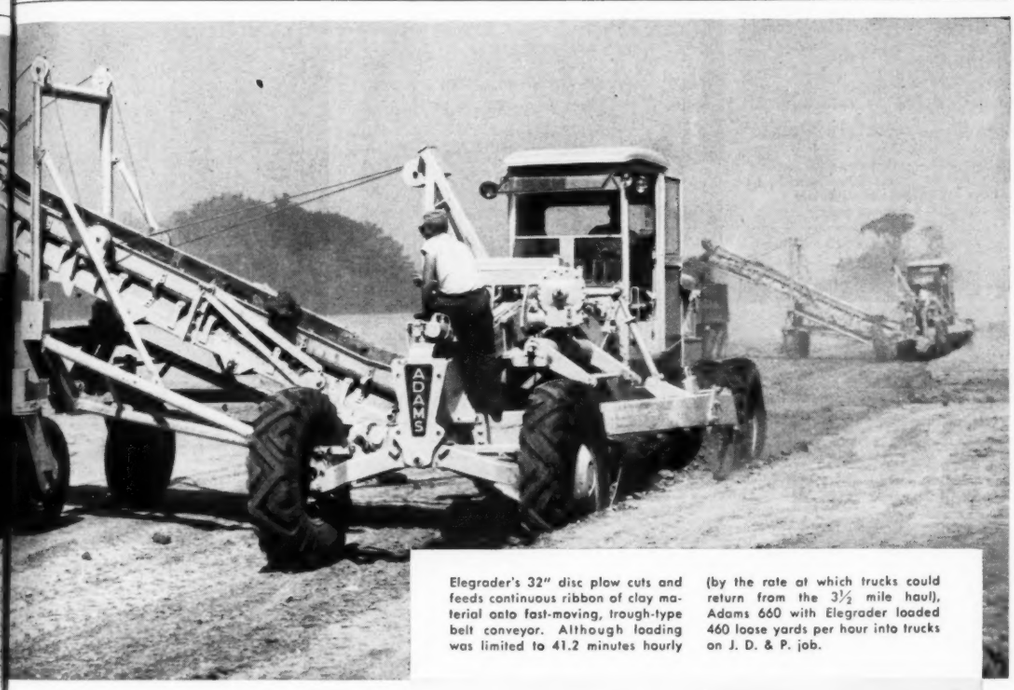
Personnel

This project is under the direction of J. E. Morris, the director of product development for Jones & Laughlin. John J. Murray is development engineer in charge. Engineering work on the project was done by the Pittsburgh consulting engineering firm of Richardson, Gordon & Associates.

The construction work is being done by Allegheny Contracting Industries, Inc., Pittsburgh. Test specimens were studied at Carnegie Institute of Technology under the direction of Dr. Charles F. Peck. The instrumentation for testing the prestressed section was designed by the Fritz Laboratory at Lehigh University under the direction of Prof. W. J. Eney. THE END

Cleveland Formgrader news

Charles L. Driscoll has been appointed chief engineer of Cleveland Formgrader Co., Avon, Ohio. Driscoll was senior project engineer on tanks and combat vehicles for General Motors Corp., and design engineer with the tank automotive center of the Detroit Ordinance District.



Elegrader's 32" disc plow cuts and feeds continuous ribbon of clay material onto fast-moving, trough-type belt conveyor. Although loading was limited to 41.2 minutes hourly (by the rate at which trucks could return from the 3½ mile haul), Adams 660 with Elegrader loaded 460 loose yards per hour into trucks on J. D. & P. job.

Cut 18" deep at 2.3 to 3.3 mph

As the LeTourneau-Westinghouse grader moved forward in 1st or 2nd gear, Elegrader's 32" disc plow "peeled off" strips of almost-dry clay averaging 18" deep. On the first slice, cut-depth sometimes reached 30" because of uneven ground. The endless ribbon of dirt fed onto 42" wide, grader-driven, trough-type belt moving 450' per min. Conveyor elevated dirt to overcast into trucks with little dust or spillage.

Other uses for Elegrader

Elegrader is a useful tool for other roadwork. It's often used on secondary roads, for cutting roadside drainage ditches and casting up dirt to elevate roadway. If it's desirable to haul material for fill or waste, it can be loaded into trucks moving parallel.

Get information and prices

Call or write us and we'll be glad to give you full details on Elegrader for use with 104, 123, 150, 190 hp Adams Graders. Other grader models: 60, 80 hp. Information is FREE . . . there's no obligation.

*Trademark AE-1254-H-6

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Where Quality is a Habit

For more facts, use Request Card at page 18 and circle No. 372

Heavy foundation of piles suppo hi

NEW Wylie ROADMASTER
MODEL 1520 ASPHALT PLANT

Making New Profits for Contractors!

★ 15-20 Tons Hourly Capacity ★ Completely Mobile

The "1520" meets the demand for a complete self-contained, mobile plant, ready to operate in minutes right at the jobsite. Available also as a skid-mounted unit, with gasoline, diesel or electric power. The Roadmaster is the machine asphalt users have been waiting for — the asphalt plant that has *everything*.

- Fully automatic batching and asphalt metering cycle
- Rotary dryer with forced draft
- Twin-shaft pugmill with enclosed oil bath gear box
- Enclosed bucket elevator and reciprocating feeder
- 400 gallon asphalt tank
- Cyclone type dust collector

Send for new 8 page, illustrated brochure

Wylie Asphalt Equipment

WYLIE MANUFACTURING CO., INC.
P. O. Box 7086, Oklahoma City 12, Okla.

For more facts, use Request Card at page 18 and circle No. 373

ROCKFORD

CLUTCH PORTS HELP

Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc

Heavy Duty Over Center

Power Take-Offs

Speed Reducers

HEAT & DIRT ESCAPE

Nine large ports in the sides and twenty-one holes in the top of this ROCKFORD Spring-Loaded CLUTCH cover provide increased ventilation during operation under adverse conditions. Extreme heat, generated by modern high-speed engines, is dissipated—to prevent burning and warping. Dirt, grease and moisture, encountered in off-highway operations, are carried away—to avoid excessive clutch wear.

SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER
314 Catherine St., Rockford, Ill., U.S.A.
Export Sales: Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

For more facts, use Request Card at page 18 and circle No. 374

Some piling is pipe-reinforced before adjacent piles are driven; more than 24,000 feet of pile shell used for nine-level section

Using a Cobi mandrel and a Vulcan No. 1 hammer in 96-foot fixed leads, a crane drives one of the 40-foot-long Armco Hel-Core pile shells for the foundation of the central portion of the Minnesota Department of Highways office building.

The biggest single job under way for the Minnesota Highway Department this year is not a road job, but the job on the new $7 million State Highway Department office building in St. Paul.

The structure will have a nine-level central portion, including basement and sub-basement, plus provisions for the addition of two more floors in case a future expansion is needed. A wing will contain the materials and research lab, and a basement garage, to bring the total floor area in the building to some 350,000 square feet.

The different parts of the structure—central portion and wing—made for different foundation requirements. While the wing section has been designed for spread footings, the central section requires more than 24,000 feet of pile shell for the cast-in-place foundation.

After some 90,000 cubic yards of dirt had been moved for the basement and sub-basement excavation, work started on the driving of the 1,006 piles, varying from 25 to 40 feet long, for the central structure's foundation. This phase of the work was subcontracted by L. H. Bolduc Co., Inc., Minneapolis, Minn., from the general contractor, a joint-venture of Lovering Construction Co., and J. S. Sweitzer & Sons, both of St. Paul.

Test piles were driven to a pene-

40% FASTER THAN ANY OTHER DRILL

McCarthy Vertical Auger Drill Model 106-24

● The McCarthy Vertical Auger Drill cuts drilling time in earth, clay, compacted sand and gravel, hard pan, shale, sandstone and rock as much as 40%. Rugged construction permits you to drive 2 to 24-inch augers to depths of as much as 125' faster than any other drill. Get the facts on the powerful McCarthy today. See how you can complete shot hole, exploration drilling, foundation holes, dewatering operations, well drilling, highway construction and heavy contract work faster than ever before. The versatile, vertical McCarthy gives you more than any other drill. Write for Bulletin M-100 now. Let us show you how you can turn new profits on your drilling job.

SALEM
MANUFACTURED BY
THE SALEM TOOL CO.
806 S. Ellsworth Ave., Salem, Ohio

For more facts, use Request Card at page 18 and circle No. 375

ppow highway building

Workmen guide 10¾-inch spiral welded pipe into a driven pile shell to serve as reinforcing while adjacent piles are put down. This will keep the pile from collapsing if boulders are moved by driving operations near by.

tration of 15 blows per inch and filled with concrete. The piles were then loaded to 100 tons with a maximum allowable settlement of 0.003 inch per ton. The final settlement of the accepted test pile totaled 0.186 inch after rebound.

A total of 342 of the Armco Hel-Cor 40-foot piles were driven at the basement level, while the remaining piles, also supplied by Armco, were driven for the sub-basement foundation. All were driven in clusters containing up to 20 piles, on 2.5-foot centers to provide a design load of 50 tons per pile.

A crane with a Cobi mandrel and a Vulcan No. 1 hammer with 96-foot fixed leads handled the pile-driving job. Difficult conditions were encountered in a number of locations because of boulders near the bearing strata. In some cases, it was necessary to reinforce piles already driven before adjacent piles could be put down.

Whenever this had to be done, removable 15-foot sections of Armco spiral welded pipe, 10¾ inches in outside diameter and with an 0.188-inch wall thickness were used inside the 12¼-inch, 16-gage pile shells.

Lee Bolduc was the superintendent for the foundation contractor, L. H. Bolduc Co., Inc. Dick Rasmussen is the general superintendent for the general contractor. The architectural-engineering firm on the project, Ellerbe & Co., St. Paul, has E. Gardner as chief structural engineer and Floyd Moe as resident engineer.

THE END

Austin-Western appoints export sales manager

Elmer H. Fredrickson has been named export sales manager of the Austin-Western Works, Baldwin-Lima-Hamilton Corp., Aurora, Ill. He succeeds Chester Cotton, who retired.

In his new position, Frederickson will direct the over-all foreign sales of Austin-Western products—power graders, road rollers, street sweepers, and hydraulic cranes—from his headquarters in Aurora.

White appoints Oakley

Robert G. Oakley has been named assistant to Karl A. Roesch, vice president in charge of the Autocar Division of The White Motor Co., Exton, Pa. For the past three years, Oakley has been branch manager of White's Akron, Ohio, office.

Oakley, who joined White in 1946, has served as branch manager at Washington, D. C., and as assistant to the vice president in charge of sales.

Broad, low-pressure tires "float" Tournapull ("C" size shown) over soft going. Deep lugs give ample traction. With self-cleaning tread design, natural running action forces mud and dirt toward edges of tire. This, plus constant tire flexing, keeps tread clean for efficient traction under all conditions.

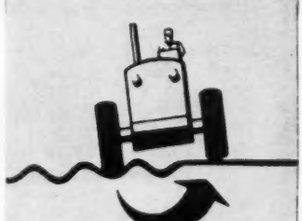
How to beat bad weather ...tough job conditions

It's no accident that LeTourneau - Westinghouse Tournapull® scrapers haul more dirt — lose less time because of bad footing and other adverse working conditions — than any comparable rubber-tired scraper combination. Sand ... soft cuts and fills ... even wet, muddy going fails to bog-down Tournapull scraper combinations. Here's why:

POWER-TRANSFER DIFFERENTIAL

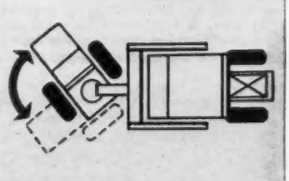
Major reason for Tournapull's success in moving impressive yardages in all working conditions is its patented, automatic, power-transfer differential. It maintains effective pulling-power on both drive-wheels — regardless of footing. When one wheel begins to spin, differential automatically transfers up to 4 times its tractive effort to drive wheel on firmer footing. Neither wheel will spin independently until the 4-to-1 ratio is exceeded.

Exclusive L-W differential works *continuously* — on turns, through mud and slippery footing, over rough, uneven ground. This gives you better traction throughout any haul cycle ... for faster, easier, more profitable dirtmoving.



ELECTRIC KINGPIN POWER-STEER

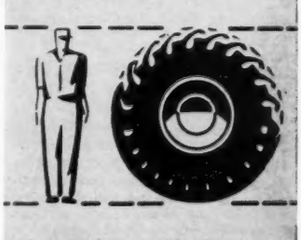
Where footing is very bad, positive electric kingpin power-steer adds to Tournapull's tractive power. Operator just flicks dashboard steering switch left, right, left, right. This pivots prime-mover from side-to-side ... "walks" drive-wheels onto solid footing. Kingpin steer also permits operator to make continuous 180° turns in space less than unit's length ... permits working in restricted areas.



BIG, LOW-PRESSURE TIRES

Big, single, low-pressure tires give *extra-flotation* to carry Tournapulls through soft going. Tire "floats" ... stays on top of the ground instead of digging in.

In addition, tires provide firm, *positive traction*. Lug height on tire is great enough, and the distance between cleats wide enough, to permit a big bite. Operation at low-pressures permits more of the tread to grip the ground in soft sand or mud. Tournapull tires get a good firm grip, but do not dig in.



Get complete facts

For more work days in "shut-down" weather, it will pay you to investigate the popular easy-loading 27-yd. B Fullpak*, 18-yd. C Fullpak, or 9-yd. "D" handyman. Call or write for complete details and owner-verified production figures. No obligation.

*Trademark P-1464-DC-1

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Where Quality is a Habit

For more facts, use Request Card at page 18 and circle No. 376

"BERG"
CONCRETE
SURFACERS

for: bridges, highways, airport runways, dams, culvert, floors, walls.

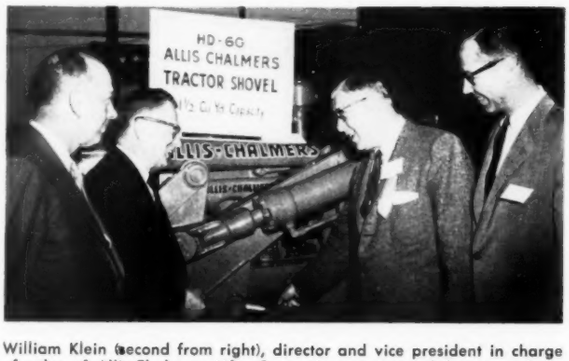
Model H-8 and H-10 (above). Gasoline powered unit especially designed for surfacing concrete highways, runways, streets, floors. Includes exclusive power take-off for attaching "BERG" flexible shaft surfacing equipment. Model A (right) is lightweight, electric powered unit that suspends from operator's shoulder. Equipped with interchangeable heads and attachments for surfacing bridges, buildings, dams, culvert, walls or similar surfaces. Wire or write for details.

CONCRETE SURFACING MACHINERY CO.

4665 Spring Grove Avenue **Cincinnati 32, Ohio**

For more facts, use Request Card at page 18 and circle No. 377

distributor doings



William Klein (second from right), director and vice president in charge of sales of Allis-Chalmers Mfg. Co., points out special features of the HD-6G tractor shovel to Harold G. Krayenhof (left), general manager of Lennox Industries, J. C. Georg, and James D. Taylor (right), contractor.

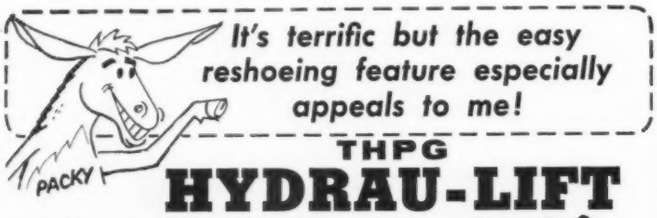
Equipment exhibit takes place on dealer's grounds

Contractors, public officials, and industrialists from New York State saw the East's largest exhibition of heavy construction machinery on the grounds of the J. C. Georg Corp., Syracuse, N. Y. More than 50 pieces of equipment represented nine major equipment manufacturing firms —Allis-Chalmers Mfg. Co., Barber-Greene Co., Clark Equipment Co., Frink Sno-Plows, Inc., Highway Equipment Co., Inc., Shunk-Torwel, Gradall Division of Warner & Swasey Co., Walter Motor Truck Co., and Worthington Corp. The J. C. Georg Corp. is a franchise agency for the nine firms for the upstate New York area east of Rochester.

Five dealerships named for B-L-H division

Madsen Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., La Mirada, Calif., has appointed five new dealers. West Virginia Mine Supply Co., 212 Ohio Ave., Clarksburg, W. Va., will service all of the counties north and east of and including Wook, Wirt, Calhoun, Braxton, Webster, and Pocahontas, excluding Hancock, Ohio, Marshall, and Brooks. Another West Virginian dealer, Machinery, Inc., 2855 Piedmont Road, Charleston, will cover counties including Jackson, Roane, Clay, Nicholas, and Greenbrier.

J. D. Coggins Co., 1717 Second St. N. W., Albuquerque, N. Mex., will handle the entire state. The state of Oklahoma will be served by R. A. Young & Son, Inc., 9401 E. Admiral Place, Tulsa. Kern-Limerick, Inc., 115 N. Spring St., Little Rock, Ark., will cover a number of counties in that state.



THPG
HYDRAU-LIFT
The New Remarkable
ROGERS DETACHABLE GOOSENECK

PATENT NO. 2590210

Hydraulically operated. Driven from power take-off or electrically from truck battery.

•

Winchless operation saves up to 1000 lbs. and hundreds of dollars in cost.

•

Operated by one man who sees and controls all operations from a single position on the gooseneck.

•

Features permit new, fast, easy changing of trailer and truck tires.

•

No pins, no wedges, no fifth wheel RAMP.

•

Overhanging loads can be unloaded with new speed and ease. Simply raise the deck—put blocking under the load—lower the deck—detach the gooseneck and pull the trailer out.

Here is the lighter, lower priced, faster detachable gooseneck that combines every wanted feature *plus* exclusive Rogers advantages.

The simplified new principle lowers the weight, reduces the cost and attains operating advantages heretofore unknown.

Its manifold advantages, some of which are mentioned briefly here, make it a most desirable unit for *every* hauler.

Write or phone for illustrated literature giving complete information.

EXPERIENCE builds 'em

ROGERS Heavy Duty Trailers

PERFORMANCE sells 'em

ROGERS BROS. CORP.

ALBION, PENNA.

EXPORT OFFICE, 50 CHURCH ST., NEW YORK 7, N. Y., U.S.A.
Cable Address: BROSITES

✓Check and you'll choose a ROGERS

For more facts, use Request Card at page 18 and circle No. 378

ELLIS METHODS of Concrete Construction

Now Being Applied in San Francisco on New $1¾ Million Silver Avenue Junior High School with Excellent Results

ROTHSCHILD, RAFFIN & WEIRICK, general contractors, use Ellis Methods and Products to great advantage in the concrete construction phases of this job. In this case, the contractor chose to supply his own wood members (optional with Ellis Methods). Selected dressed 4 x 4's cut to standard lengths, with ends squared, are being used. Shown above, the workman is staining them in a small vat and stacking them to dry. Staining wood members a distinctive color preserves the lumber, warns the carpenters not to cut or misuse them, and makes for a neater job . . . as you will note in the rows of shores and heads visible in this picture. The shore-members, heads, purlins, and joists thus produced on the job are used with Ellis Metal Parts attached for utmost speed and economy in shoring operations. On the Silver Avenue construction project, the builders are using 3,000 shore clamps, 1,000 slip-in shore holders, 400 head clamps, and 12 jacks—all of which are immediately reusable, as are the contractor's own woods.

For suggested methods on your next job, at no obligation, mail specifications to:

Ellis **MFG. CO., INC.** 211 NORTHWEST 4th STREET OKLAHOMA CITY, OKLAHOMA

For more facts, use Request Card at page 18 and circle No. 379

A SALES AND SERVICE traveling show for P&H dealers is ready to leave the grounds of the Construction & Mining Division, Harnischfeger Corp., Milwaukee, Wis. After a final check by (left to right) traffic manager Ploetz, general sales manager Catalane, and sales promotion manager Parthum, the show will travel over 4,000 miles visiting 22 Eastern and Midwestern states. Each stop is scheduled to place the show in a P&H dealer's showroom on a Friday morning.

Standard Steel dealers

Nine dealers have been appointed by Standard Steel in the South and West. The list includes the Texas Machinery & Equipment Co., Amarillo, Texas; Wheeler-Kershaw Co., Salt Lake City, Utah; Municipal Sales Co., Richmond, Va.; Craig Taylor Equipment & Supply Co., Anchorage, Alaska; and Starline Equipment Co., Boise, Idaho.

Additional dealers are Borchert-Ingersoll, Inc., St. Paul, Minn.; The George F. Smith Co., Inc., St. Louis, Mo.; Melvin Pine & Co., Inc., New York, N. Y.; and Equipos Industriales y Agricolas, S. A., Mexico, D. F.

Standard Steel Corp., Los Angeles, Calif., has appointed nine new dealers. The list includes the Armstrong Equipment Co., Birmingham, Ala.; James H. Hope, Sacramento, Calif.; K. C. Diesel Power Co., North Kansas City, Mo.; and J. E. Snider, Gardiner, Maine.

Other dealers are Highway Equipment & Supply Co., Lincoln, Nebr.; Central New York Equipment Co., Inc., Syracuse, N. Y.; Contractors Sales Co., Inc., Albany, N. Y.; Constructors Equipment Corp., Philadelphia, Pa.; and Osborne Equipment Co., Knoxville, Ky.

Koehring and subsidiaries name dealers

Three new dealers have been appointed to handle the sales and service of the line of equipment made by the Koehring Co., Milwaukee, Wis. McDonald Equipment Co., Little Rock, Ark., will cover all but 14 counties in the state.

Central Ohio Tractor Co., 3765 E. Livingston, Columbus, Ohio, will serve 37 counties in Ohio; and Minneapolis-Moline Co., Eastern Industrial Division, 215 Brookpark Road, Cleveland, Ohio, will handle 18 Ohio counties.

The Colorado Builders Supply Co., 1534 Blake St., Denver, Colo., has been appointed an exclusive distributor for the line of ditching machines produced by the Parsons Co., Newton, Iowa, a subsidiary of the Koehring Co., Milwaukee, Wis. The new dealer will cover the states of Colorado and Wyoming.

Alderson Supply, 5003 E. Admiral Place, Tulsa, Okla., has been appointed a distributor for the line of mortar mixers and power wheelbarrows manufactured by the Kwik-Mix Co., Port Washington, Wis., a division of the Koehring Co., Milwaukee, Wis. Alderson Supply will handle 27 counties in Oklahoma.

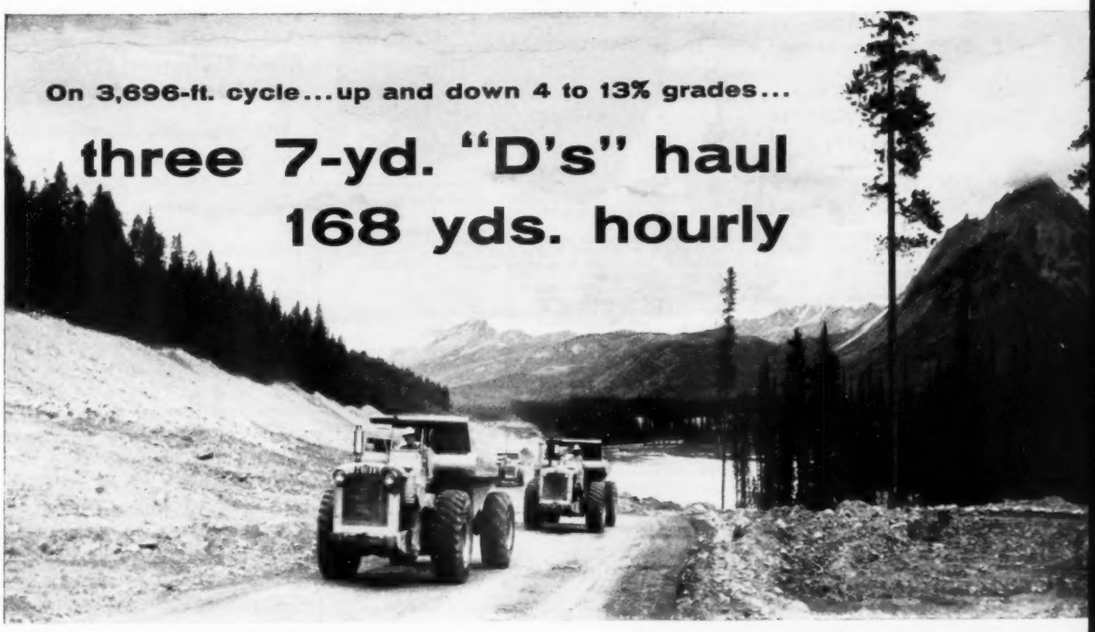


Photo shows Rear-Dumps on return portion of cycle, climbing grades to 12%. This new section of Trans-Canada Highway will eliminate narrow twisting roads with many hairpin turns.

Square M Construction Company Ltd. of Edmonton, Alberta, had 1,200,000 yds. of earth and rock to move on a 6-mile section of Trans-Canada Highway 1, eight miles west of Banff, Alberta. To help haul material, contractor brought in 3 LeTourneau-Westinghouse 7-yd. (11-ton) D Rear-Dumps. Here's how Tournapull haulers performed:

Rear-Dumps are shown here building a 10-ft. lookout point between grade of new highway and Bow River.

8 loads per hour

Three to 4 passes of a 2-yd. shovel loaded D Rear-Dumps with 7 yds. of rocky material in 58 sec. Units hauled 1,584 ft. down 4 to 13% grades to fill area, where load was spread in 18 sec. On 2,112-ft. return, units climbed grades to 12%. "D's" completed the 3,696-ft. cycle in 6 min. 40 sec. Each Rear-Dump hauled 8 loads per hour . . . for a total combined production of 168 yds. hourly.

Perfect safety on steep grades

On the steep-grade portions of each cycle, Rear-Dump's positive kingpin power-steer . . . 4-wheel, multi-disc air brakes . . . and excellent traction of big, low-pressure tires . . . gave operators complete safety and control, even at high speeds.

"The equipment for today's jobs"

With work progressing ahead of schedule, Foreman Carl Andreff said, "These units are the equipment for today's jobs. They can maneuver in tight places . . . travel through soft, spongy going."

Insure future earnings

An added advantage with Tournapulls is that rear-dump, scraper, bottom-dump, lift-and-carry crane, or flat-bed hauler can be used behind same prime-mover. With this interchangeability, you can adapt Tournapull to any type of future operation . . . keep busy the year-around . . . earn more annually. There are 3 sizes of L-W Rear-Dumps to choose from: 11, 22, or 35-ton capacity. Call or write for production figures, price, and delivery.

Building a 10-ft. lookout point between grade of Trans-Canada Highway and Bow River, D Rear-Dump spreads its load in about 18 seconds. Electric controls respond instantly for positive, controlled dumping.

Three to four passes by 2-yd. shovel fill 11-ton Rear-Dumps to heaped capacity. Low rear entry and wide bowl provide easy target for shovel operator . . . allow fast swing-out of shovel dipper, let shovel operator heap maximum yardage with minimum spillage.

Tournapull—Trademark Reg. U.S. Pat. Off. DR-1375-H-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Where Quality is a Habit

For more facts, use Request Card at page 18 and circle No. 380

distributor doings

Buffalo-Springfield news

The Buffalo-Springfield Co., Springfield, Ohio, a division of the Koehring Co., has appointed two dealers for its line of road rollers and compaction equipment. Frantz Equipment Co., 50th Street and Wynnefield Avenue, Philadelphia, Pa., will also carry the Buffalo-Springfield line in its branches in Lancaster and Fallsington, Pa., and Wilmington, Del.

The other Buffalo-Springfield dealer is J. W. Bartholow Machinery Co., 1221 S. Lamar St., Dallas, Texas.

Kelbe Bros. Equipment Co., Inc., 5686 N. Teutonia, Milwaukee, Wis., has been appointed a dealer for Buffalo-Springfield. Kelbe will handle the complete line of road rollers and compaction equipment manufactured by Buffalo-Springfield.

Clark Equipment division appoints seven dealers

The Construction Machinery Division, Clark Equipment Co., Benton Harbor, Mich., has appointed seven dealers to sell and service the Michigan line of tractor shovels and excavator cranes.

Interstate Equipment & Supplies Co., Inc., 208 River St., Montpelier, Vt., will cover the entire state.

The entire state of Nevada and certain California counties will be serviced by Graid Equipment Co., N. Wells Ave. at Fifth St., Reno, Nev. Cramer Machinery Co., 1140 S. E. Seventh St., Portland, Oreg., will handle a section of Oregon and a portion of Washington.

Equipment, Inc., Highway 80 West, Jackson, Miss., will cover a number of Mississippi counties.

Manitoba Province will be handled by Construction Equipment Co., Ltd., 661 Wall St., Winnipeg, Canada.

The division has extended the sales territory for Buran Equipment Co., Oakland and Santa Clara, Calif., distributors of the Michigan line of tractor shovels, dozers, and excavator cranes. Buran's new branch, located at 13900 S. Norwalk Blvd., Norwalk, Calif., will cover additional counties, part of Inyo County, and lower California.

Armstrong Equipment Co., 4601 First Ave. N., Birmingham, Ala., will cover all counties in Alabama, and the Florida counties west of the Choctawatchee River.

Dealership's 30th year

Mississippi Road Supply Co., Jackson, Miss., sales and service firm, is celebrating its 30th anniversary this year, has nine representatives covering 65 Mississippi counties for such manufacturers as International Harvester Co., Galion Iron Works & Mfg. Co., Bucyrus-Erie Co., Frank G. Hough Co., M-R-S, Drott, Cleveland Trencher Co., and Bethlehem Steel Co., to name a few.

Alaskan dealer for Eimco

Northern Supply Co., Inc., Anchorage, Alaska, has been named a dealer for the Territory of Alaska by the Eimco Corp., Salt Lake City, Utah. Northern Supply, located at 400 Post Ave., is adding 10,000 square feet of warehouse and showroom space at its headquarters.

H. O. Penn president made trade board director

A dealer making news in more than one area is Ralph H. Johnson, president of H. O. Penn Machinery Co., Inc., New York, N. Y. Johnson is now a director of New York's Bronx Board of Trade.

Joy appoints dealer

Chiles Tractor & Machinery Co., Springfield, Mo., has been named a dealer for the line of portable and stationary air compressors, rock drills, air tools, jibs, and hoists produced by the Joy Mfg. Co., Pittsburgh, Pa. Chiles Tractors will operate in the southwestern part of Missouri and in southeast Kansas.

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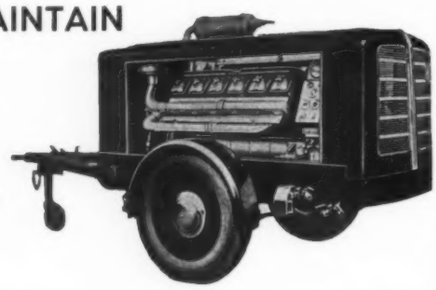

Famous IRMER & ELZE air-cooled diesel-driven compressors, imported from West Germany, deliver more compressed air per pound of fuel than comparable liquid-cooled units. The compressor you need for a given air capacity weighs less and costs less when it's an air-cooled I&E.

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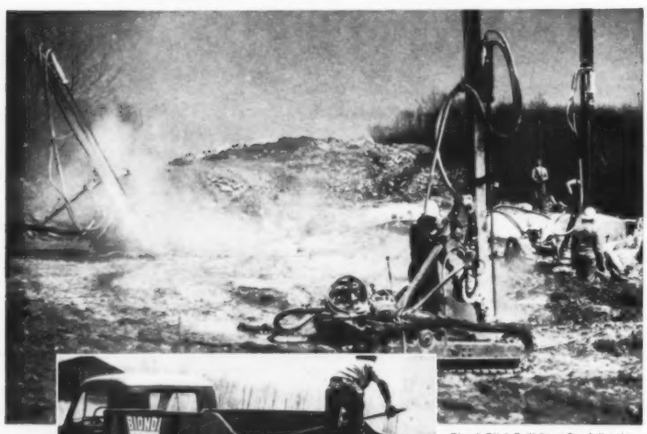
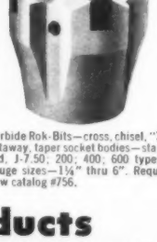
UNION BUILDING chose Brunner & Lay ROK-BITS
for rock removal on
CONNECTICUT TURNPIKE



Biondi Bit & Drill Steel Co. delivering Rok-Bits to Union Building's field warehouse. 2⅛"; 3" and 3½" Rok-Bits being used. Get details on the use of 2¼" bits for faster deep hole drilling.

Moving nearly one million yards of rock on Section 320-01 of the Connecticut Turnpike presented special drilling problems for The Union Building & Construction Corporation, of Passaic, N. J. Drilling granite, up to monumental hardness, Union Building increased their footage and reduced bit changes by using Brunner & Lay Rok-Bits.® Pulling extension steel was not necessary on lifts of 20 to 25 ft. thanks to Rok-Bits ability to hold their gauge and cutting edge. Time was saved. Costs held in line. Write for details on this job, also on other Rok-Bit drilled turnpike jobs.



Carbide Rok-Bits—cross, chisel, "X", cutaway, taper socket bodies—standard, 1-7.50; 200; 400; 600 types—gauge sizes—1¼" thru 6". Request new catalog #756.

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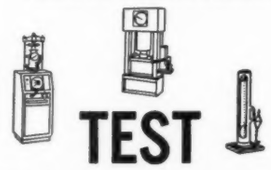

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The Engineering Department

Field work change orders

This is the nineteenth in a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

The contract documents usually provide for proper authorization for additions or deductions in the work These provisions may be for lump sum price, unit price, cost plus a percentage, or fee. Once a change has been determined, it must be properly authorized, all parties must be notified, and material and labor quantities be added or subtracted from the original.

If the work is being done under contract, the mechanics of handling changes is covered by a "Change Order" which, when signed by the client, becomes an addendum to the contract. Copies of a change order are made for all parties concerned, including the job organization.

A change order gives a complete description of the change, the reason for the change, and refers to drawings and specification revisions. When a change order is issued, it sets off a chain of events in the various departments concerned. Drawings and specifications need to be altered, materials ordered or canceled, subcontracts revised, accounting figures adjusted, and field operations altered.

The superintendent or project manager should never make changes in the work without proper authorization in accordance with the contracts documents, even though such changes do not entail additions or deductions in the contract price. Authorizations for all changes should be made in writing, as called for in standard contract documents, since the owner is not bound to pay for those made otherwise.

Field work orders

On cost plus a percentage or fee-type contracts, the owner can make any changes as the work progresses, and many contractors record and handle such changes as "Field Work Orders". Even though work is on a percentage or fee basis, changes should be valued and recorded, so that the contractor is justified for expenditures made and has an explanation of possible overruns in costs. At the same time, these forms enable the contractor to handle the details without confusion and delay.

If the percentage or fee contract has a guaranteed maximum clause, the cost of changes becomes important as possibly adding to the cost and penalizing the fee.

On complex industrial-type construction—the cost system on the construction isolates costs on each individual unit of building and equip-

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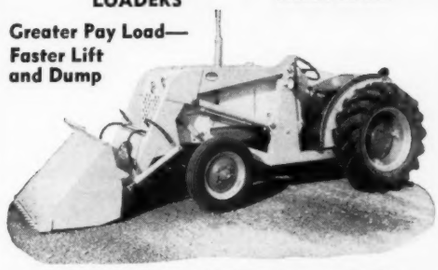

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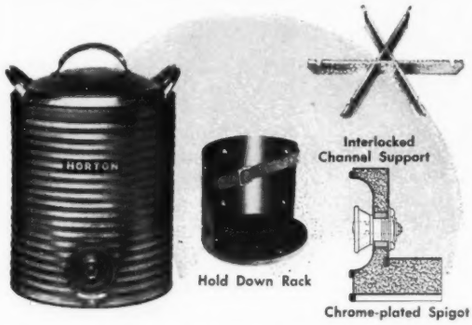

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ment for future taxes and depreciation—the field work order system must be sufficiently flexible to record every part of the change from drawing revision to final completion.

Preparing such work orders

Field work orders void standard practice procedure on change orders. The field work orders are prepared and issued to record additions to the work which will add to unestimated expense, and record deductions from the work as specified; describe the change in detail so that all parties will fully understand what is required; alter drawings to show the work as actually performed; and secure materials. It is also used to specify the department that will perform the work, give complete specifications for the work, state the completion date, record the authorization, estimate the cost, isolate the cost of work from the original and record the cost, and give the proper cost distribution.

These work orders can also be used to add or subtract the quantity of items called for in the original plan, alter the quality of materials originally specified; authorize alternations requested by the operating department; alter plans; plan revisions after work has been started; and change the job location. Field orders also take care of omissions on plans; allow for variations in material costs over the original estimate; allow for cost of labor and materials in changing existing work, so that new work may be installed; and provide for temporary installations to keep the unit operating.

No changes, additions, or deductions can be made on any work without the superintendent of construction signing the work order change.

Change order procedure

In large companies, for example one that has its home office in New York, those who have authority to order changes or additions are the chief engineer in New York, and department heads on the job site. A memorandum confirming the change will usually be sent by the chief engineer in New York to the superintendent of construction. Emergency work may be performed without waiting for New York confirmation. If a minor change is undertaken, it is reasonable to accept the confirmation as a matter of form.

The superintendent of construction may authorize changes to a limit without securing written confirmation.

Copies of the field work orders go to the New York office, the superintendent of construction, cost engineers, the purchasing department, job foremen, timekeeping department, engineering office, property department, and job field engineer. All field work orders are prepared by or under the supervision of the cost engineer, who is supplied with the proper data by the superintendent of construction. After a rough draft has been prepared, the superintendent checks it, and the work order change is distributed to the persons involved.

Labor and materials changes against the work change order are accumulated on the cost schedules against the work order, field work order number, and the work classification.

Engineering estimates

Estimates are prepared to figure the cost of the contemplated construction, check the bidders' quotations, and furnish costs for additions and deductions called for by field work order changes. All requests for estimates are handled through the superintendent of construction, who issues instructions for their preparation. Exceptions to this are estimates prepared by the cost engineer to cover extra work. All estimates must be prepared on the standard estimate sheet—Form 73—and a carbon copy must be filed at the engineering office.

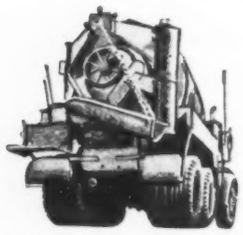
If the work order is to be charged to an operating account, the account number is to be filled in and the shop order number given. For new construction—when no appropriation has been made to cover the estimated work—a special HB account can be taken by the superintendent and the expense temporarily charged to it. The expense may be charged directly as a construction expense. In an HB account, the charges are transferred at the end of a month to the appropriation for work estimate. If no appropriation is made, the deferred charges are cleared to expense.

When estimates are made to check bidders' prices, or for field work orders, charges are made directly to the work that benefits. Estimates for improved practice are charged directly to construction expense.

Estimating methods

When an estimate sheet is filed, the date, month, and year must be filled in, the estimates numerically listed and filed in the engineering department, and a carbon copy retained by the estimator. Six typed copies are distributed to the construction and design department, the person requesting an estimate, the cost engineer, the assistant superintendent, and the field engineer.

At the top of the first sheet on



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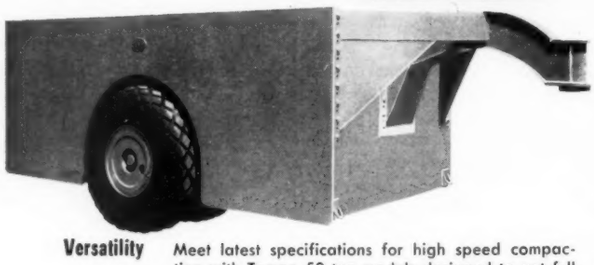

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every estimate there must be a description of the work, and references to a drawing number, if any. In the extreme left hand column, there should be a description of each item on the estimate sheet. It is important that the items are not lumped together. Brick, for instance, should not be figured by the square foot including plaster, but as an individual item.

Preparatory to pricing and making up the estimate, it is important that quantities of the different kinds of materials be estimated in the same sequence in which the work will be done. Only if an estimate is prepared in this way can the separate costs be checked against the amount estimated.

In measuring plans or listing the quantities from plans, the figured, rather than scaled, dimensions should be used whenever possible. No allowance for contingencies should be made in listing quantities. The contingency allowance is made in one lump sum on the last sheet of the estimate.

Quantities taken off plans should be as accurate as possible. These quantities are used to check the progress of the work in the field, and if they are not accurate, it will throw the entire administrative organization out of gear.

If required labor costs are not available, they may be calculated from the individual labor rate in force. These may be secured from the construction timekeeper. Material costs can be secured from the commodity file in the construction purchasing office. If the file is not available, the purchasing agent will get the costs.

Labor and material costs are totaled on the last or summary sheet. To this total is added the allowances for contingencies, engineering, and expense. Contingencies are generally figured at 5 per cent of the total estimate; engineering, as a percentage of the total estimate; and expense, as a percentage of the total labor. The expense rate changes each month, and current rates can be secured from the cost engineer.

Estimating value

It is obvious that the detail connected with handling change orders or field work orders can be a very simple transaction confined to describing the change, arriving at a price, and securing the owner's signature. This presumes that it is not necessary or desirable to isolate the actual costs of such a change. It is necessary to go through the detail of the standard estimate if the itemized costs are needed to arrive at tax and depreciation values. In this case, all labor and material charges must be isolated to the change order number or field work order number, and a new account is aded to the main contract account.

This system is particularly helpful on government contracts subject to renegotiation, when the contractor will want to know actual costs of changes as compared to estimated costs.

(Next month's article will deal with "The engineering department—field engineering."

Simplicity Co. head dies

Larry B. West, president of the Simplicity System Co., Chattanooga, Tenn., died last month at the age of 88. Simplicity manufactures asphalt plants.

West was also well known in the South as a former contractor in paving and general construction. His son, William C. West, will carry on the business.

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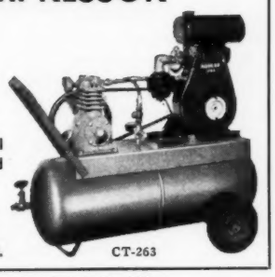

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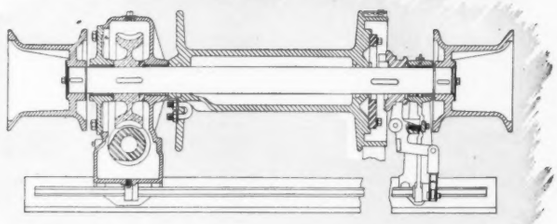

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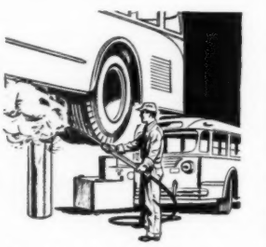

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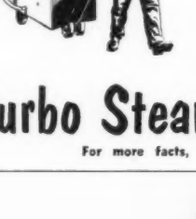

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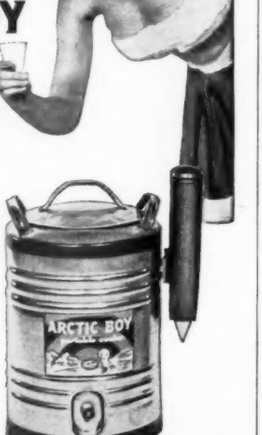

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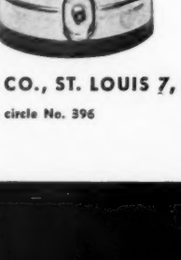

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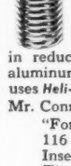

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Surveying Washington

by HUBERT KELLEY, JR.

Contract procedures on federal construction, a bill to prevent bid shopping and peddling after the prime contract has been awarded, was modified in the House from similar legislation proposed in previous years. The bill, as reported out by the House Judiciary Committee and cleared for action by the Rules Committee, provides that a general contractor bidding for a federal lump-sum award over $100,000 must list, in his prime bid, the names of the mechanical specialty contractors he will engage to perform each major category of work. The measure applies to government projects to be performed in the continental United States and Alaska.

The chief difference in this bill from legislation offered since the 82nd Congress is in the so-called five-day clause. This permits a general contractor to substitute a different mechanical specialty subcontractor, from the one he listed, within five working days of the opening of the prime bids. No reason has to be given for the change, but the government must be notified.

The notification will be final unless the government has reason to suspect the change was prompted by wrongdoing, in which case it has the discretion to investigate.

The purpose of the five-day clause was to eliminate undue rigidity in administration, one of the prime objections to the previous bills. The five-day leeway, according to the Judiciary Committee, gives the general contractor a "fair opportunity" to make any necessary investigations of the subcontractors' credit standing, financial responsibility, reliability, qualifications, equipment, current workload, and the like. It would also give the contractor time to check the completeness and accuracy of any subbid and to evaluate other competing subbids, which on the surface may be slightly higher but on comparison may be better because of broader coverage.

The bill further states that a general contractor need not specify a subcontractor for a particular mechanical specialty category, if the contractor requested a minimum of three bids and received none that was complete or satisfactory by five business days prior to the opening of the prime bids. However, unless further delay is found excusable, the low bidder to get the award must find a subcontractor to do the work—or list himself for the work—within five days after the prime bid is submitted.

The new bill, authorized by Rep. Thomas Lane (D.—Mass.), carries the endorsement of the Associated General Contractors of America, which fought some of the features of the previous measures. AGC, however, is on record as stating that government intervention is no "cure-all" in relationships between general contractors and subcontractors.

Even though some of their suggestions were incorporated in the bill, the Defense Department and General Services Administration are against the legislation. This agency opposition raises the definite possibility of a White House veto in the event the measure gets through Congress unchanged.

Last year a generally similar bill—but without the five-day clause—passed the Senate but failed House passage by 15 votes.

The provisions of the Lane bill would take effect six months after enactment. But they could be waived, if the chief procurement officer in charge of a government project determined that compliance with the act would cause possible delay harmful to military or public policy.

The thinking behind the Lane bill is that bid shopping or peddling restricts active subbid competition and prevents the government from getting the lowest price possible on a project, inasmuch as mechanical specialty work is estimated to represent 40 per cent of total government construction cost. The Judiciary Committee said mechanical specialty contractors are "reluctant" to bid on federal construction, because present procedures give them no assurance they will perform the work when their bid to the general contractor is low.

But bid misuse was termed a two-way proposition in which negotiations between a general and sub are un-

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fairly continued after the prime contract has been awarded on the basis of another subbid.

General contractors and subcontractors will benefit from the Lane bill, it is claimed. The general contractor, the committee report said, will be protected from unfair competition from the few unethical operators. Contractors will also take care to get an adequate number of subbids from mechanical specialty contractors before submitting their prime bid. And having firm specialty bids prior to the award, contractors will have no incentive to bid shop after the award has been made.

On the other hand, it was added, the assurance that their bids will not be shopped will encourage the subcontractors not only to bid on government work but also to submit their lowest possible figure in advance of the award.

The committee report emphasized that the five-day provision could be misused by sharp operators and took pains to point out that it is not intended as a loophole to permit peddling or shopping "of any kind, limited or otherwise."

Negotiated contracts over $100,000 will also be covered in the proposed legislation. The reason for this was that the securing of final subcontract prices prior to awards will be even more financially important to the government when it does not have the benefit of competitive bidding after public advertising. There was also fear that government agencies might swing over more and more to a system of negotiating contracts if such contracts were excluded from the bill's provisions.

The principal objections to the Lane bill lodged by the Defense Department and GSA were that:

It is discriminatory to subject mechanical specialty contractors to its provisions while exempting non-mechanical subcontractors, sub-subcontractors, and suppliers.

It would add to the government's administrative costs.

It would set the stage for further government controls over the construction industry. Said GSA on this point: "The requirement for naming mechanical specialty subcontractors would undoubtedly establish a strong precedent which could lead to the introduction of subsequent legislation covering subcontractors of all construction trades and their subsubcontractors and suppliers."

It departs from established practice which, according to GSA's experience, has produced no "positive evidence of bid shopping. . . ".

It would further complicate present federal construction contract procedures and discourage bidding on government work even more.

Government agencies also assailed the bill on the ground that it provides no express penalties in the event a general contractor violates the procedures set forth. Proponents of the measure admit that the bill itself contains no teeth for enforcement, but argue that there are ample provisions in other federal laws and contract practices to penalize "errant contractors." They mention the Copeland Act relating to kickbacks and the Davis-Bacon Act on minimum wages for workers on government projects.

They also assert that Uncle Sam can provide for liquidated damages in the contracts and require contractors to post performance bonds which the government can refer to in the event contractors violate the provisions of the Lane bill. THE END

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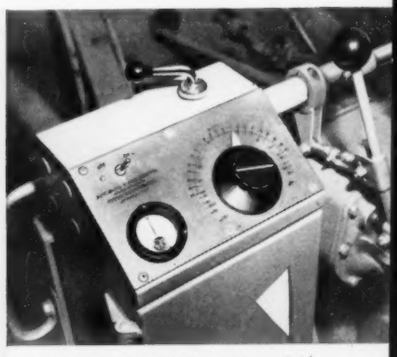

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CONSTANT MESH TRANSMISSION: On-the-move shifting is easy and fast because large gears remain in mesh, do not have to be shifted.

MANEUVERABILITY: The No. 12 is unmatched in this department. Oscillating tandem drive makes backing across ditches easy. Leaning front wheels make turns shorter, steering easier.

But these brief facts are only a hint of the Caterpillar No. 12's superiority. Get the full details from your Caterpillar Dealer. You can always count on him for fast, dependable service and quality replacement parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK

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TIME, LABOR COSTS CUT IN HALF
by versatile Michigan Tractor Shovel

Savings of 40 to 90% in time and 50 to 75% in labor costs resulted when the Selmer Company, Green Bay, Wisconsin, assigned material handling on all their city-area building jobs to this Model 75A Michigan Tractor Shovel.

"You might say the Michigan combined the mobility of a pickup truck with the traction of a crawler," explains one Company official.

Saves 3 man-hours unloading blocks

Above is a common assignment—moving palletized concrete blocks from trucks to scaffolding. Unit lifts 68 blocks, weighing 3,800 lbs AT ONCE. These are stacked 10 ft high so laborers can skid blocks direct onto scaffolds. Entire job, including stacking, takes two men 10 minutes. Unloading alone used to take five hand-laborers an hour. And an elevator had to be used continually.

Replaces expensive crane to unload marble

Unloading carloads of marble or cast stone always gave Selmer Company a costly headache too. Formerly, they rented a crane. Recently, however, their veteran shop foreman, Norb Tilkens, designed and fabricated a special boom which attaches to the tilt bracket. With this, the Michigan reaches across a truck, lifts two or three slabs of marble from the railroad car, gently lowers each 700 lb load to the truck bed. In a few hours, the car is completely unloaded. Savings on a typical 15-car shipment run $500 or more.

Eliminates ramps, pump set-up for concrete

Left is another home-made attachment . . . a concrete bucket which can be lifted on the Michigan forks. It carries four wheelbarrowfuls per load. Pour is made simply by tilting forks slightly forward so concrete flows out of 6" square spout into forms. Time and labor of barrow-men are saved. Nor does Selmer have to build ramps or, on small pours, set up a pump.

One man changes bucket, forks

Some of these jobs, you'll note, call for fork lift, some for track shovel bucket. These two attachments (and others) are easily interchanged. It takes Selmer's operator, working alone, 10 minutes.

In two years, NO breakdowns

No matter what the job, Selmer can *depend* on their Michigan working a full day! "In two years . . . over 6,000 operating hours," recalls Shop Foreman Tilkens, *"we've NEVER had the machine break down* on the job! It has saved us over 50% in time and manpower!"

A Michigan could do as well for you

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2407 Pipestone Road
Benton Harbor 28, Michigan
In Canada: Canadian Clark, Ltd.,
St. Thomas, Ontario
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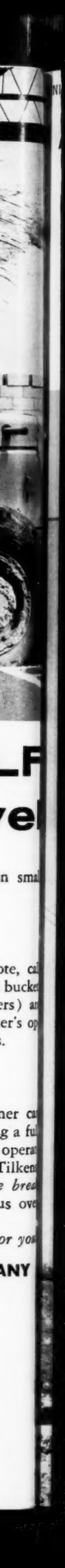
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